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AEROPLANES FOR OUR 15c.c. ENGINE SEE INSIDE

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AMATEUR MECHANICS
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Hobbies

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August 19th, 1933.
No. 1974.

Published every Wednesday.
Registered at the G.P.O. for Transmission by Canadian Magazine Post

Building the OLYMPUS THREE

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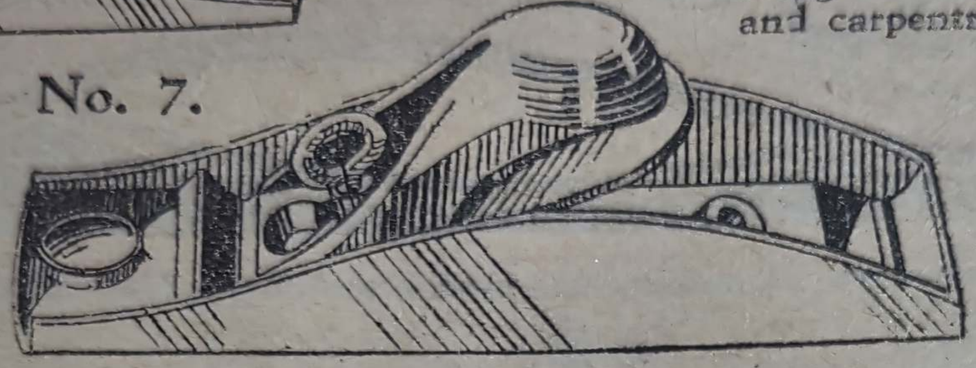

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Hobbies

Vol. 76. No. 1974. Published Every Wednesday AUGUST 19th, 1933

AEROPLANES FOR OUR 15 c.c. ENGINE

By E. W. Twining

READERS will remember that, commencing in the issue of HOBBIES for March 11th last, I gave a short series of articles, with drawings, describing the design for a single cylinder petrol engine of specially light construction, suitable for driving a model aeroplane, and having a cylinder capacity of 15 c.c. This engine, the reader will also know, has been built by Mr. F. J. Camm, as his several notes in these pages have indicated. On a bench test this little two-stroke motor has driven a 20in. propeller from a revolution speed of 2,500 up to about 3,500, but at the moment of writing I do not know the pitch of the propeller, and therefore it is not possible to calculate its thrust. I have now been asked to design a machine which will be suitable for utilizing this engine as its power plant. That the engine is capable of flying a model has been amply demonstrated by Mr. Camm and, it therefore, seems a fitting corollary that a 'plane should be designed and submitted for the use of those readers who have obtained a set of the castings for the engine and wish to adapt their motor to flight. The question arises, however, as to what type of machine would be the most suitable to adopt. I cannot help thinking that very great precaution should be taken to protect the air screws, and particularly the engine, against damage by collision either with the ground or some obstacle it may meet in flight. In the case of a nose-dive crash, as I have previously pointed out in other articles, not only is the screw liable to be smashed, but the engine crank shaft, and possibly the bearings, irreparably damaged. There are two ways in which the revolving parts can be protected: one is by placing an efficient guard outside of the air screw, which shall take the shock of collision, and the other by putting the power unit in such a position that it cannot possibly come in contact with the ground or any other object whilst flying.

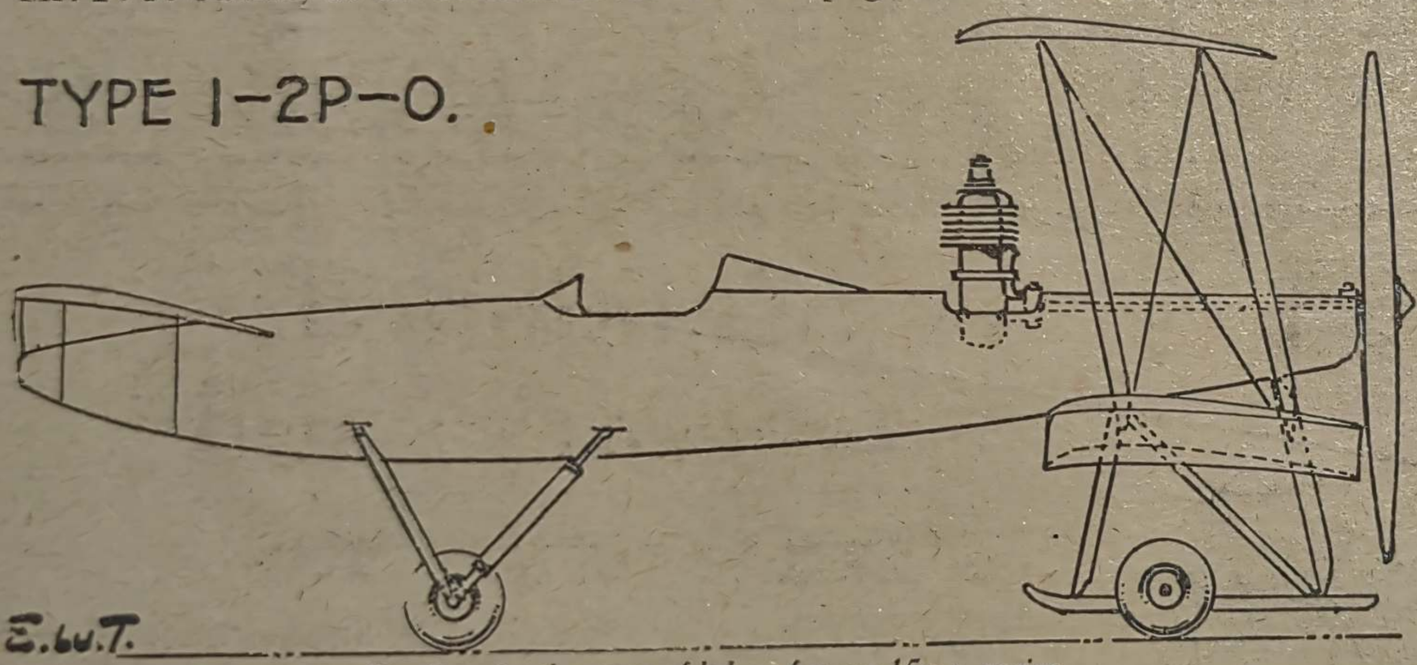

Fig. 3.—Another type of 'plane for our 15 c.c. engine.

Three Different Types.

After considering matters very carefully I have decided to let the reader himself settle upon the particular type which he will build, and if this is done we may have the advantage of seeing power-driven models which are not all uniform in type at some of our model flying meetings, for one is inclined to get a little bit tired of seeing the everlasting tractor monoplane or biplane and nothing else. The three types which I propose to give are, first, an O-P1-1; an O-2 P-1, and a 1-2P-0. The first

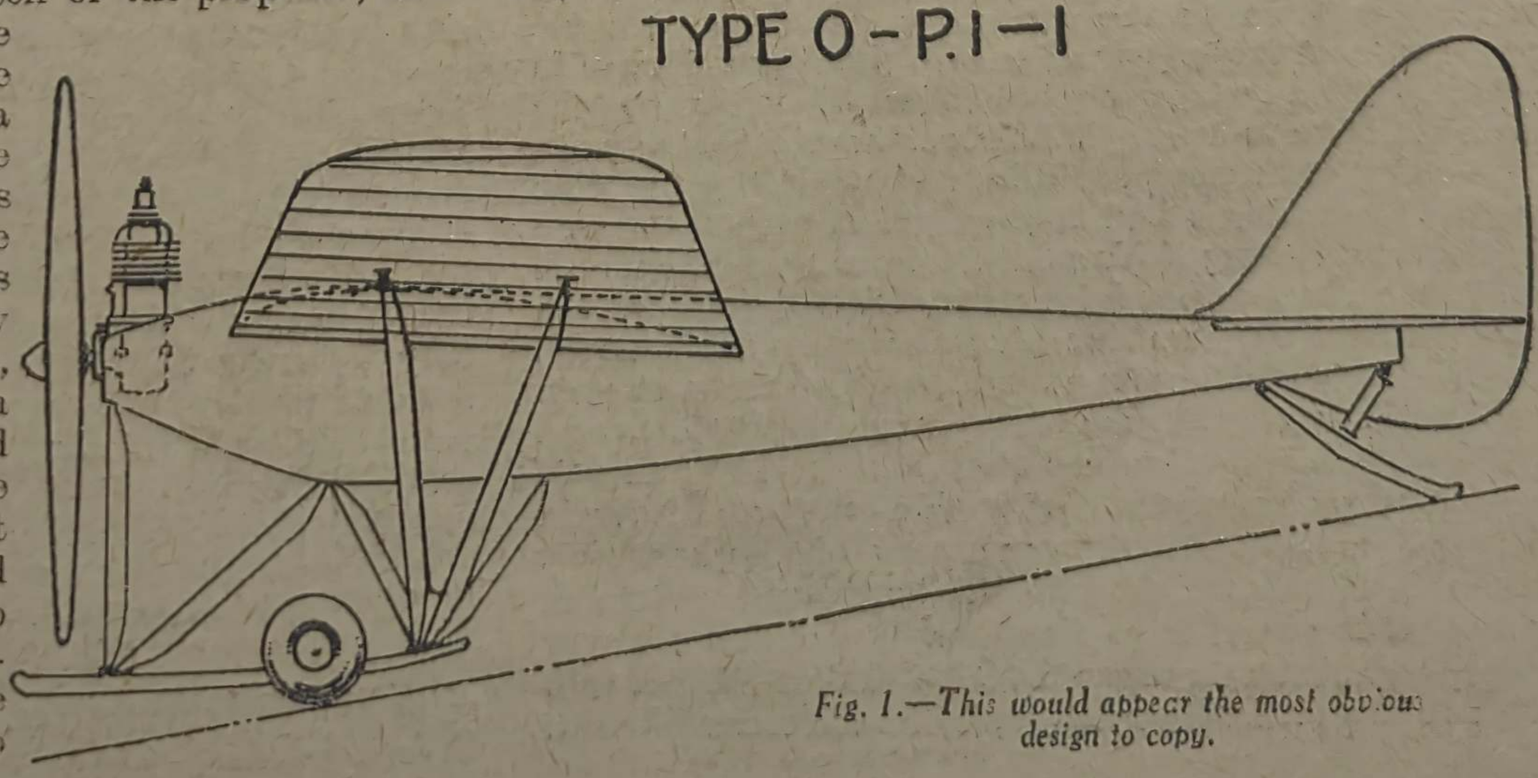

Fig. 1.—This would appear the most obvious design to copy.

is, of course, a tractor monoplane of the usual cut-and-dried form, excepting for the fact that it will have a pair of strong skids projecting forward from the undercarriage for the purpose of protecting the air screw. The second is a biplane, and in this the tail will be carried on four booms, the fuselage or nascelle stopping behind the trailing edge of the main planes. Between the tail booms a pusher propeller will work, and the model will therefore be a fairly close copy, so far as type is concerned, of the well-known F.E.2B. The third, although there is very much to commend it, will, I fear, not be popular, simply because people are not accustomed to seeing the type in full-size practice.

General Arrangements and Details.

I do not think that it should be necessary for me to go into the matter of every little detail of construction separately for all three machines. It should suffice the reader if I give him a complete general arrangement drawing of each; that is to say, a side elevation, a plan and a front elevation, and then supplement these drawings by sketches of such constructional details as will be equally applicable to all three. As only a portion of one set of drawings can be published in any one issue, I think it will be as well to show the reader here a more or less diagrammatic sketch of the three machines together, so that he may this week begin to give consideration to which type he shall build. These are shown in Figs. 1 to 3.

As will be seen from the sketches, all three of the models are fuselage machines and in every way orthodox. They could, therefore, be looked upon as prototypes for practical full-size aircraft, and when completed they should, except for the obvious single cylinder, resemble very closely full-size machines, as do Captain Bowden's models, although I have not been fortunate enough to have seen any of these latter.

TYPE O-2P-1.

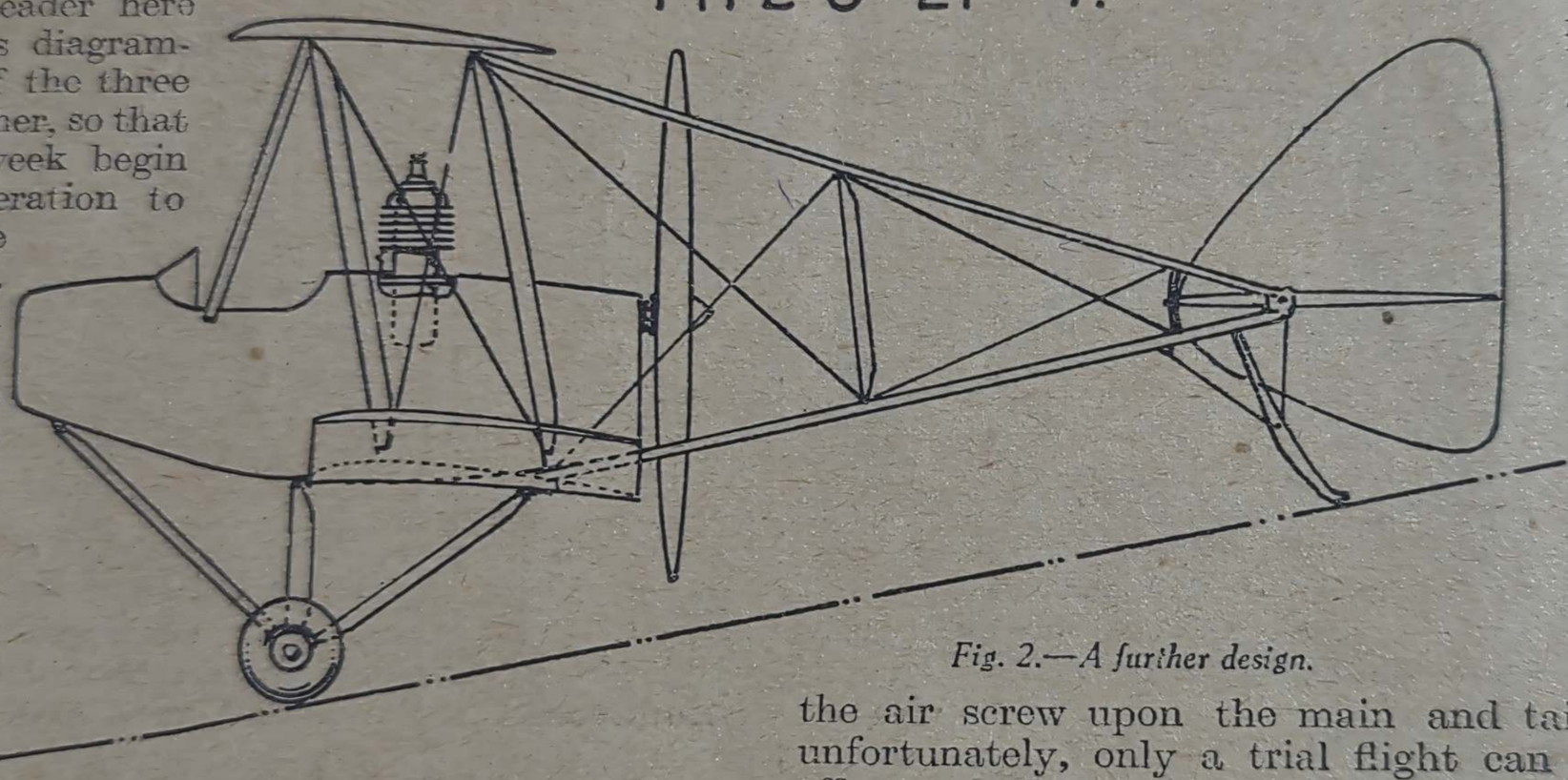

Fig. 2.—A further design.

Protecting the Air Screw.

I cannot help referring again to the matter of the perilous position of the air screw. I do so because the reader may be attracted to the type shown in Fig. 1. This seems on the face of it to be the obvious design to copy. If he considers the sketch carefully along with the possibilities of what the machine may do in making a bad landing, he will see that, even with the protecting skids which I have drawn, there is still just a chance that injury may be sustained by the engine should the machine dive at a very steep angle, the skids may break in an actual nose-dive crash or even if they do not, the machine may somersault and so the propeller and engine may still be injured. Of course, it may be argued that such a crash as I have in mind is bound to break some part of the machine. This, undoubtedly, is an obvious truth, and, after all, the cost of a propeller or the trouble of making a new one is nothing when compared with a broken wing or tail. I am not so much concerned with the air screw as with the engine. A bent or broken crankshaft, a strained crankcase and perhaps a cylinder knocked out of truth, may render the engine only fit for the scrap-heap.

Automatic Stability.

It may be contended that if a machine is properly designed and constructed and in proper flying trim, I could not crash, or should not. This is a truth which it admit, but how many models are trimmed to absolute perfection on their first flight? Of course, they ought to be, but in nine cases out of ten they are not. The models which make nose-dive crashes are either incorrectly designed or are out of adjustment when they are launched. It is quite a common thing to see a well-designed model with either the main plane in the wrong position or the tail making an incorrect angle with the main wing, and so, as one of the engine-driven models, when it is completed, will be valuable in that it will be the result of many hours of labour, I cannot impress too strongly upon its builder, if he chooses the O-P1-1 type, to make very sure that the centres of pressure and the centres of gravity all exactly coincide, that the main wing is perfectly true without twist, and that the tail surfaces also are true, and the horizontal ones make the correct negative angle with the main plane. With this type of machine, even when all these points are attended to, there is still a factor which may upset our adjustments and plans—a factor the value of which is to a great extent unknown. That is the effect of the slip stream from the air screw upon the main and tail surfaces, and, unfortunately, only a trial flight can settle what this effect may be.

Aerodynamics.

As I have indicated in previous articles, I believe that a model intended for flight should be given a wing of the maximum efficiency, and, further, I think that it should be given the highest value for K1: that is to say, for lift.

The wing which has the highest lift for a given chord and span is not necessarily the fastest wing, but in a model speed is a disadvantage rather than otherwise, and so I consider that the lift to drag ratio is of not very great importance. What this comes to is that Kd, *i.e.*, drag, produced by a wing section does not matter so long as we have a contour which gives the maximum lift. In other parts of the machine, of course, everything which produces drag should be eliminated; here I am only referring to wings. I have searched through the data of most well-known wings, and about the highest value of K1 which I can find for a monoplane wing is that of the Göttingen 436. The value for K1 in this wing at 2.5 degrees angle of incidence (which is the angle of attack on which I have based calculations for all three of the models), is .274. For the two biplanes I have chosen section R.A.F. 3, which has a value for K1 of .279, at the same angle.

(To be continued.)

BUILDING THE OLYMPUS THREE

By F. J. Camm

A Splendid Economy Receiver, on modern lines, with many Novel Features. Cheaply constructed, it is extremely Selective, and will reach out in an astonishing manner.

Fig. 1.—The set is housed in a cabinet constructed on modern lines, including a sliding frame, space for speaker, batteries and accumulator.

THE most remarkable thing about this set is that in spite of the fact that it has not an "ode," "dyne," "stat," or any other fancy suffix, and probably because of its very simplicity, it yields remarkable results. Not only is it simple to operate and simple to build, but it is certainly cheap, up to date, and selective.

Entirely Self-contained.

The set is entirely self-contained, and owing to its simplicity in design will not give a greater output than about 230 milli-watts, and as such it is not suited for use in conjunction with a moving-coil speaker. With the speaker which we have selected, however, ample volume may be obtained, and I can recommend its construction with every confidence. You will be amazed at the manner in which the set will reach out for a fair distance on to the Continent, for most of the foreign stations ordinarily required by the listener are brought in with a minimum of knob-twiddling.

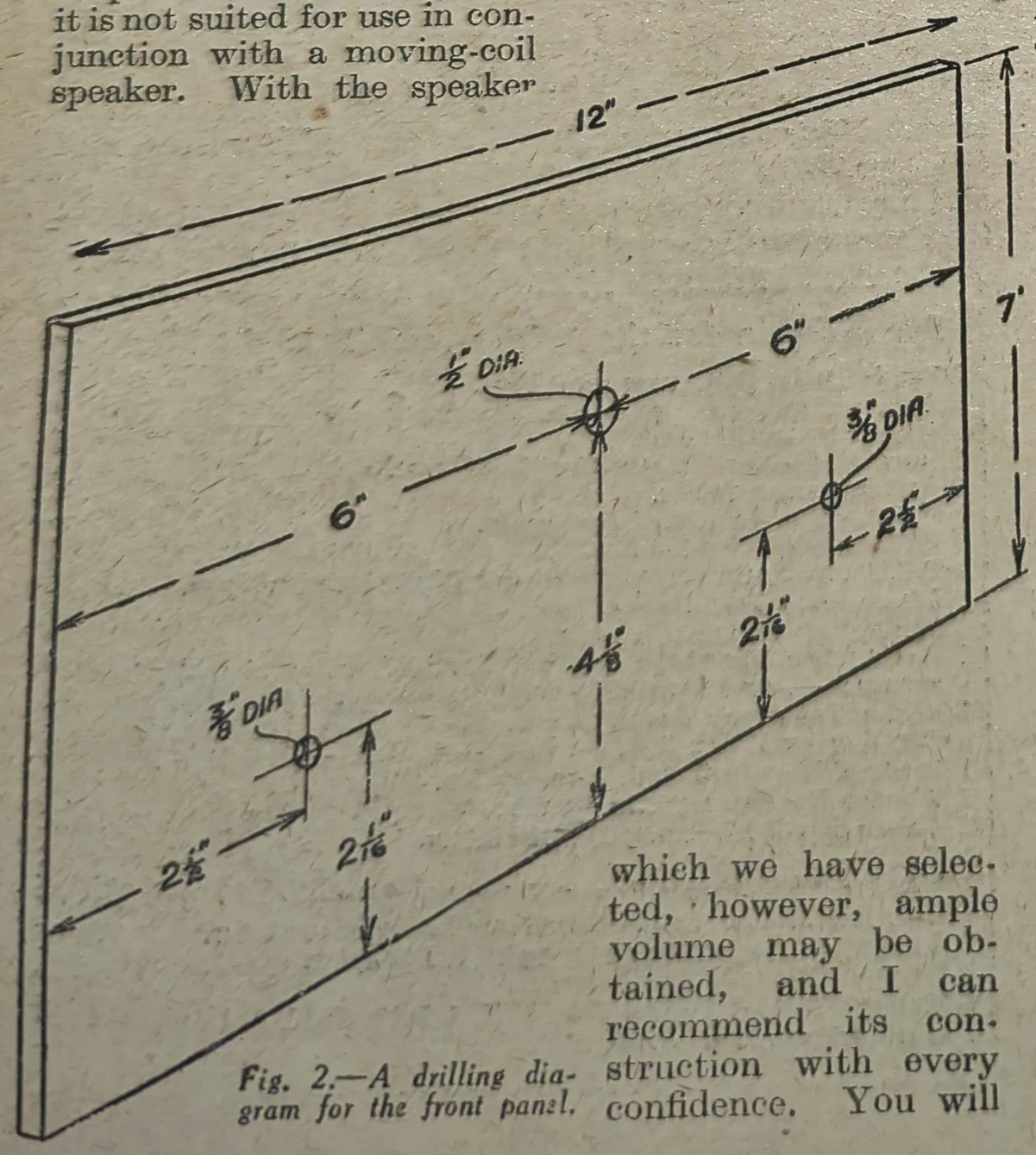

Fig. 2.—A drilling diagram for the front panel.

Before proceeding with the description of the construction, a word or two about the cabinet is necessary. This is of Clarion manufacture, and, designed on modern lines, includes a complete slide-in frame upon which a frame aerial may be wound. Certain modifications, of course, would be necessary to render the set suitable for frame aerial reception. This is a matter, however, we hope to deal with later.

Owing to the minimum number of components included, the wiring will be found practically "fool-proof"; owing to the limitation in the number of control knobs, the tuning-in of stations will also be found "fool-proof"; and, finally, owing to the type of inter-valve couplings which have been included, the quality of the reception will satisfy even the most critical listener.

The first inter-valve coupling includes, besides the usual L.F. transformer, two additional components, which remove a certain amount of external wiring. In addition, the method of connection employed in the component enables a high standard of quality to be obtained.

The coil includes a wave-change switch, an on-off switch, and a variable selectivity (or volume control) device. These three controls are combined in the one knob. It will be seen, therefore, that although the circuit consists of the rather orthodox detector and

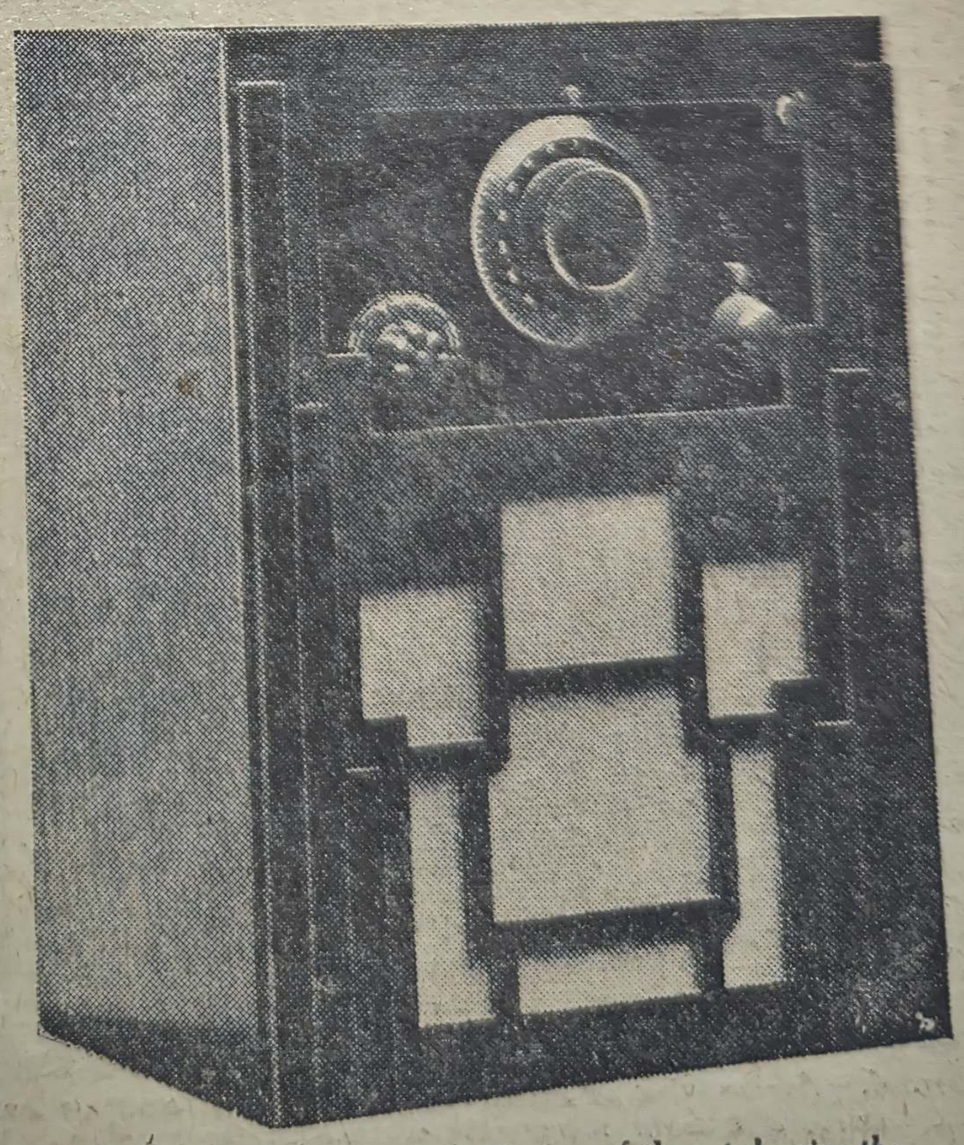

Fig. 3.—A three-quarter front view of the set showing the attractive lines of the cabinet, and the operating controls.

2 L.F. arrangement, there are sufficient novel features included in the receiver to suit the requirements of the home constructor.

Construction.

Having described the special features of the receiver, we may now get down to the description of its construction, and even the beginner will find no difficulty in following the instructions given below.

First of all lay out the various components on the baseboard in the positions shown in the circuit diagram. Note the arrangement of the two inter-valve couplings before screwing them down, so that the wiring will be correctly carried out without, for instance, having to remove one of the transformers and turn it round. It is little points like this that sometimes make the construction of a receiver irksome. Do not drive in a single screw until you are quite certain that each component is in its correct position, and the right way **round.** In this particular receiver all the components may be screwed down before any of the wiring is carried out. Note that a small hollow must be filed in the lowest portion of the terminal block carrying the pick-up terminals. This hollow should be just large enough to hold the battery cords firmly in position. Mark out and drill the panel in accordance with the panel lay-out, and then attach the two condensers by means of the fixing bushes. No problems of any kind should have arisen so far, and the receiver is now ready for wiring, a process which will take a little longer than the previous part of the work, and one which will require just a little care, although it will not be found actually difficult.

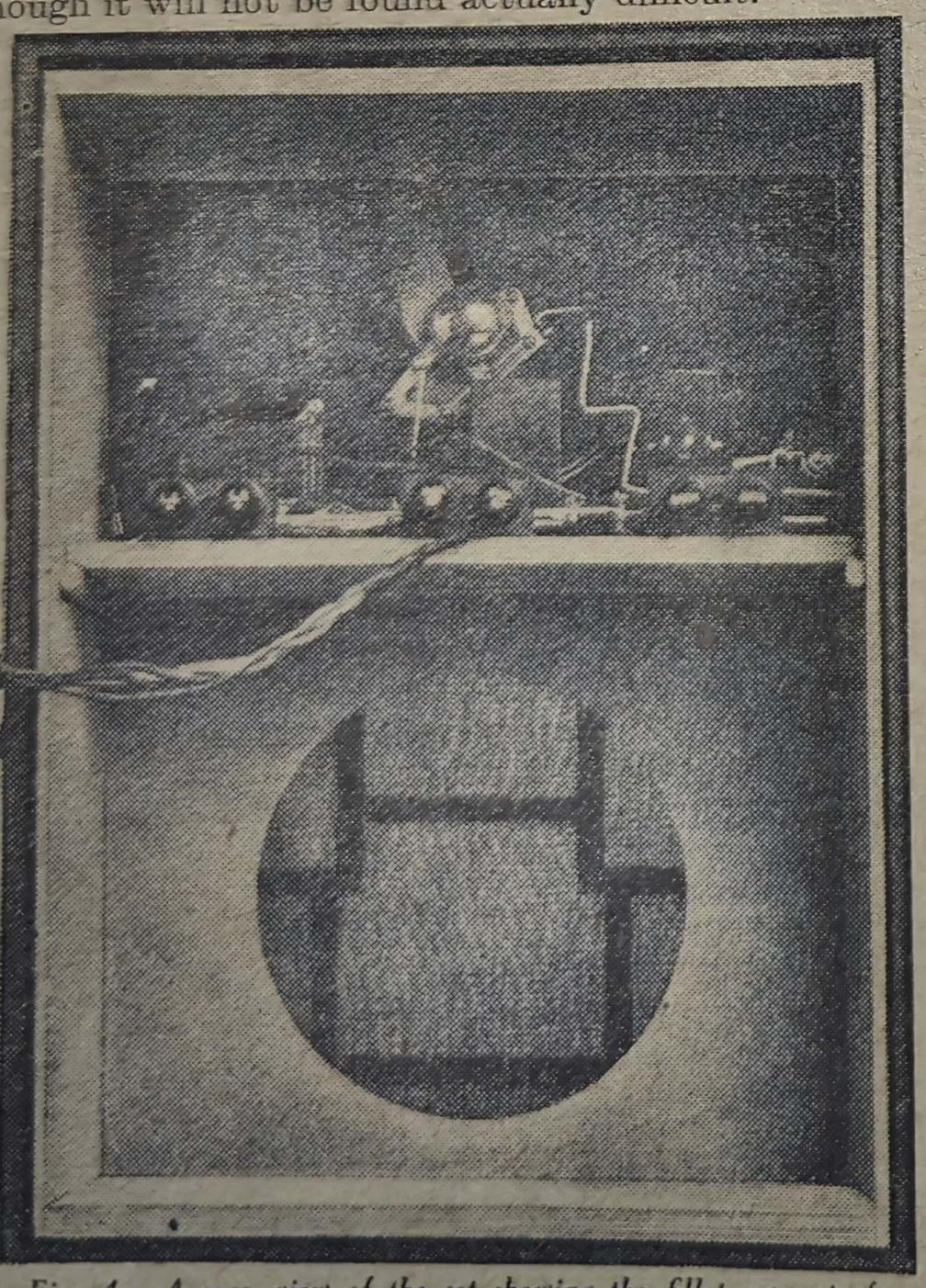

Fig. 4.—A rear view of the set showing the fillet supports for the baseboard and the roomy compartment for the speaker and batteries.

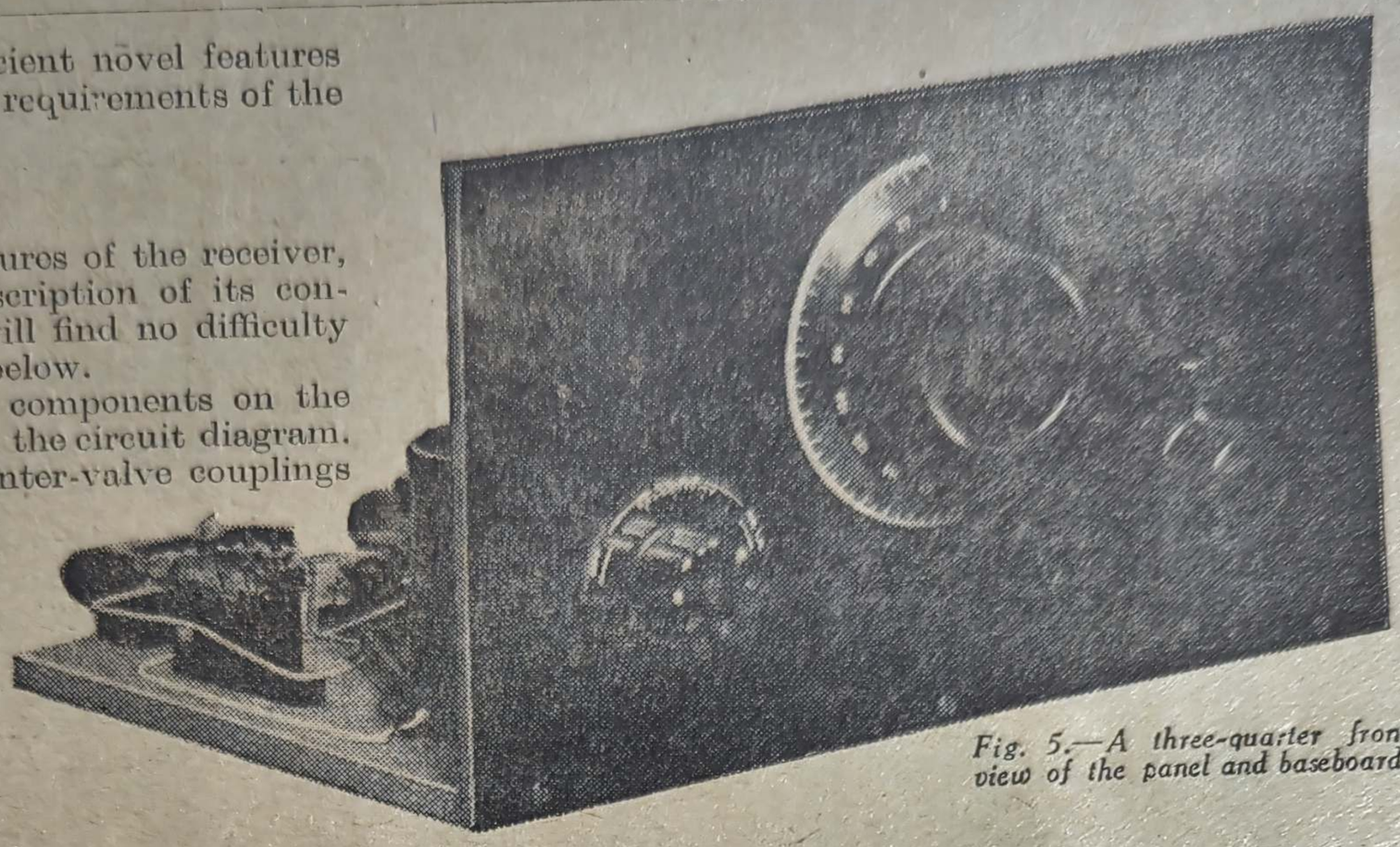

Fig. 5.—A three-quarter front view of the panel and baseboard.

Wiring.

In any receiver it is always preferable to wire up in a systematic manner rather than by just putting in a wire here, and then another wire there. Personally, I have always adopted the procedure of wiring low potential parts first, then wires carrying high voltages, and so on. I would therefore suggest that the same idea be carried out in this set, that is, wire the filament leads first, then the leads to grid and plate terminals, and so on; as each wire is put into its place, cross out the corresponding wire on the wiring diagram. By working in this fashion one is assured of putting each wire in its correct position, and when the job is finished no wires will be found to have been omitted or put into the wrong position. Note that one terminal on the transcoupler is not used in this particular circuit arrangement.

Testing Out.

When the wiring is completed, plug a Mullard P.M. 2. DX valve into the detector valve-holder, that is the one in front of the tuning coil; a P.M. 1 L.F. into the next holder, and a P.M. 2 into the remaining holder. A 2-volt accumulator is used with these particular valves, and the two L.T. leads should be joined to the positive and negative terminals of the accumulator. The H.T.1 lead should be plugged into the 90-volt tapping on the

Specification for the "Olympus" Straight Three

1 Ready Radio Dual-range Coil Unit.
1 Jackson Bros. J.B. .0005 mfd. Variable Condenser, mid-log line, with slow-motion dial.
1 Igranic .00015 mfd. Reaction Condenser.
1 Bulgin Transcoupler.
1 Skeltun Colt 5-1 L.F. Transformer.
3 W.B. 4-pin Valve-holders.
1 T.C.C. .0002 mfd. Fixed Condenser, three-terminal type.
1 Lissen 2-meg. Grid Leak.
3 Belling Lee Terminal Mounts.
6 Belling Lee Terminals (Aerial, Earth, Loud-speaker +, Loud-speaker —, and Two Pick-up).
1 Belling Lee 5-way Battery Cord.
4 Clix Wander Plugs, G.B. —, G.B. — 1, G.B. — 2, G.B. +.
1 Permcol Ebonite Panel, 12in. by 7in.
1 Wooden Baseboard, 12in. by 8in.
2 Bulgin Panel Mounting Dial Pointers.
1 Coil Lewcos Glazite.
1 "Motor" S.40 Super Power Unit with Cone.
1 Ever Ready 2-volt 40 ampere hour L.T. Accumulator.
2 Ediswan 60 volt super-capacity H.T. Batteries.
1 Lissen 9-volt grid bias battery.
3 Mullard Valves, P.M. 2 DX, P.M. 1 L.F., P.M. 2.
1 Clarion "Olympus Straight Three" Cabinet.

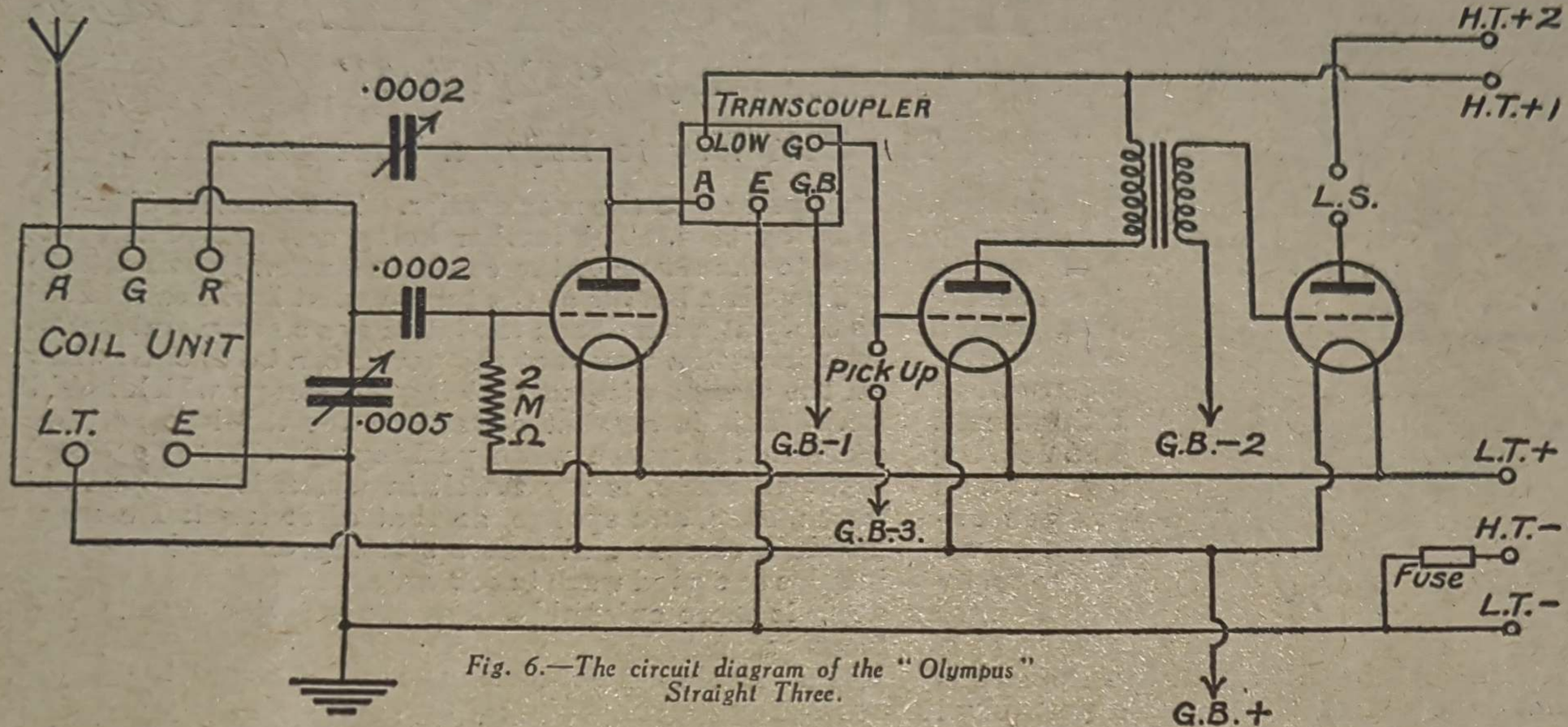

Fig. 6.—The circuit diagram of the "Olympus" Straight Three.

high tension battery, and H.T.2 into the 120-volt socket. The grid bias is also a critical adjustment, and the valves recommended by the valve-makers for the voltages applied in this particular circuit are 4.5 volts for G.B.1 and 9 volts for G.B.2. By using these values you will be assured of quality and long life to the valves. Attach a loud-speaker to the L.S. terminals and you are ready to tune in. The knob on the left of the panel should be turned as far as it will go to the left when the set is not in use. In this position the valves are turned off. Now turn this knob a few degrees to the right and the receiver is switched on, and is in its most selective condition, which means, of course, that signals will be at their weakest. Rotate the centre dial, which will enable you to tune to various wavelengths, and you should soon be able to hear your local station, which you will find will only occupy a very small space on the tuning dial. You may be in a good district, and be able to hear two or three stations with this particular setting of the first dial, and without the use of the third or right-hand dial, This controls the reaction condenser and serves to increase the strength of the stations. Having rotated the tuning dial to the end of its scale, advance the left-hand dial a few degrees farther to the right, and again run round the tuning dial. You will find now that other stations are audible owing to the increased coupling afforded by the aerial coil. When the left-hand dial is rotated completely to the right the receiver is automatically tuned to the long wave band, and Daventry, Radio-Paris, Hilversum, and other long-wave stations will be heard.

On the normal waves, in order to listen to some of the weaker foreign stations which transmit on a wavelength rather close to our own high-powered stations, a balance has to be struck between the left-hand knob and the right-hand one. In other words, the selectivity has to be increased to enable the station to occupy a very narrow band on the dial, and this naturally reduces the strength. Then the reaction control has to be employed to build up the strength again, and in this way it is possible to hear such stations as Langenberg, for instance, without any background from the Northern Regional.

If you are situated very close to one of our main stations, you may find it advantageous—from the point of view of avoiding distortion due to overloading—to use, in place of the P.M. 2 valve, a larger power valve, such, for instance, as the P.M. 202, or even the P.M. 252. With these valves a greater output is naturally obtainable, but it must be borne in mind that the high-tension consumption will be increased and this will destroy one of the features of this receiver—economical running.

It will be noticed that two pick-up terminals are provided in the centre of the baseboard. The bias lead from one of these terminals must be inserted into the grid battery at about 6 volts, whilst the other terminal is joined in the receiver to the grid terminal. When the pick-up is in use, the control knob on the coil unit must be turned to its most selective position—that is, just as far as the first marking on the selector scale. There will then be no risk of the wireless programmes being heard in the background. If the pick-up is very sensitive a volume control will have to be used to reduce the output from the pickup to a level which can be safely handled by the P.M. 1 L.F.

Do not forget to rotate the left-hand knob to switch off.

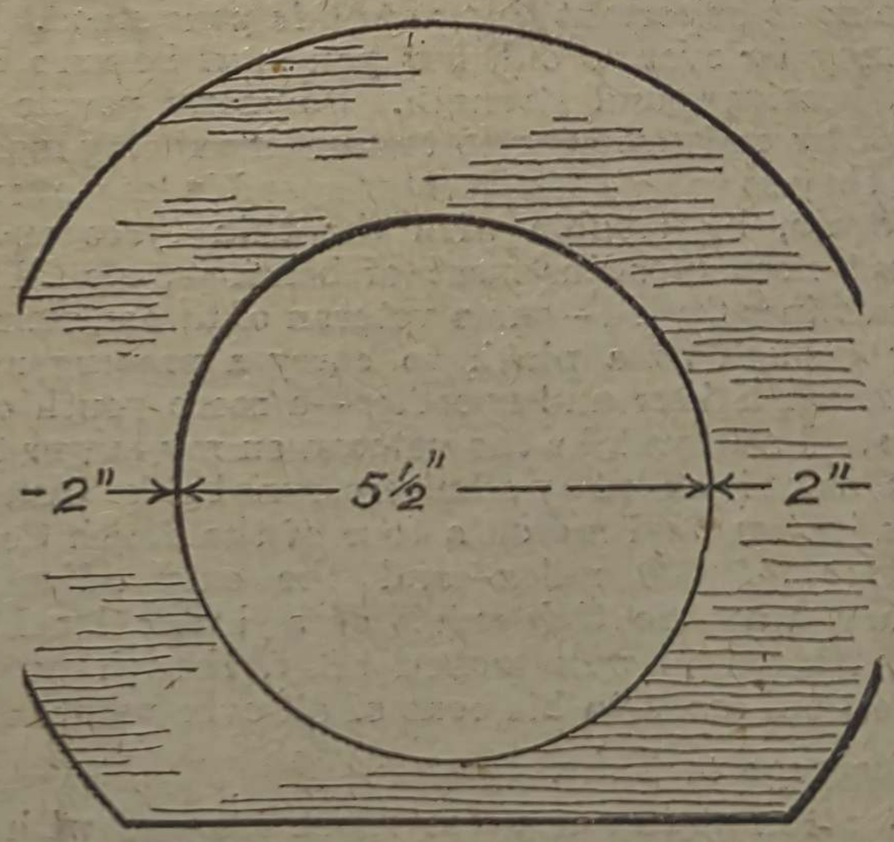

Fig. 7.—Details of the speaker baffle.

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HOW TO CYCLE TOUR

By "Cyclist"

The Best Way to Enjoy a Tour on Wheel.

IS there a better way of seeing the country than awheel on a trusty old cycle? I think not. Travelling by train proves expensive and to many even a motor cycle is a luxury not to be thought of. And if within the means of a cyclist, what true son of the humble push-bike, with all its limitations, would willingly exchange an old friend for what might easily prove an enemy?

I have just completed my sixth cycle tour south of the Thames and offer a few observations for the benefit of those who may be contemplating such a holiday.

There are so many "don'ts" which might be written. And if I wrote them you would conclude that a cycle tour was not worth venturing. But there are joys which more than compensate for the drawbacks!

You must start out with a determination to treat delays, hills, and bad weather as the things to beexpected. If the fates be kind, rejoice exceedingly; if otherwise, still rejoice.

Study Your Steed.

A chum is desirable, but not essential. Two of my trips have been of the solitary kind, but, by chumming up with all and sundry on the road, the long miles have slipped by unnoticed. And there are times when it is good to get away and think. So that whilst I personally would welcome a good pal I would not forego my tour because one was not forthcoming.

The most important thing of all is your steed. Your bike may be ever so old, but you *must* be sure of its tyres, bearings, and strength. So many people come to grief by endeavouring to tour with a racing machine. What they save by their greater speed is lost over and over again, by trouble with the thin tyres and the frequent need of adjustment of bearings, etc. I have two machines myself—one a veteran of fifteen summers, strong enough at a pinch to carry a passenger; the other much lighter and speedier—a mere youth of five seasons. I always take the veteran on my longer tours. Tarzan, as he is called by admirers, runs better than ever. He has just carried me on a tour of the South Coast—a matter of 300 miles—and the only adjustment necessary was the tightening of a brake block. Of course, Tarzan is well looked after, though he looks rather an old crock in his coat of all-over paint.

What Luggage to Take.

Don't attempt to carry too much luggage with you. Send a parcel or two to a post office en route. Be sure that a good raincoat or cape and leg overalls are carried. I prefer the former myself as, on a chilly evening, the raincoat is welcome at your journey's end, whilst you look round the town or village where you are putting up.

For touring I have a soft leather pouch which is strapped on to the rear carrier. The pouch is 5½ins. by 9ins. by 3ins. The leather being soft and pliable, will give to the shape of the contents stuffed tightly within.

There is a handle at the top on what I will call the lid, to carry as a handbag; the latter has a strap and fastens over in such a way that the pouch can be opened whilst on the carrier without undoing the straps which hold it on. This is a great advantage for the last article I place in the pouch when packing up, after spending a night en route, is my towel, in which is wrapped hair brush, soap, and sponge, so that after lunch I can rest beside a stream and before starting on another stretch indulge in a good wash in *soft* water. I think the wayside wash is more enjoyable than the wayside meal. Your baggage, excluding waterproofs, should not exceed 10lbs. It should comprise those items which the individual considers absolutely necessary for daily use.

Start Early.

Always make as early a start each day as possible. I find it a good plan to have breakfast twenty miles from the place where the night was spent. Not only is an appetite obtained, but the rest over breakfast is beneficial. Don't have too heavy a meal in the midday period. Do not have a settled route. Just map out your general direction and ascertain from your route book the distances between the towns you wish to take in. Never say "I will be at such and such a place by such and such a time." This striving against time is fatal to all holidays, especially to one awheel. Do not try to travel quickly. It not only tires one but much that is beautiful is lost. Take frequent roadside rests, extending yourself at full length on the grass. Walk every hill which makes hard work of pedalling. By doing so you rest your leg muscles, get a fresh seat in your saddle and add materially to your capacity for long distances. By following the foregoing I have done over eighty miles in a day on Devonshire roads with ease. And Devonshire roads are amongst the most difficult in the kingdom.

The best drink for the road is tea. If you do not mind the trouble and extra weight of a couple of pounds you can carry your own tea making set. I have one which packs into a half-pint metal cup. Generally speaking, however, it is better to purchase en route. I find it better to have a light meal of sandwiches at noon, a long rest after, a high tea at five, and then a thirty mile spin after tea. The latter is the best riding period of the day. If possible choose your holidays in May and June—the evenings are at their greatest length then, the country at its best, night accommodation and accommodation en route easier to obtain. September is also suitable.

For the night choose a good hotel—temperance for preference. The latter are usually cheaper and less crowded and understand the needs of a cyclist better. Do not mind a wet day. Some of the best runs have been done in a steady downpour. You have clearer roads no dust, and less heat. With a reliable waterproof you have nothing to fear. Keep your mount well oiled and tyres well pumped. Avoid main roads when possible—the bye-roads, if rough, are more beautiful. Don't attempt too much. A final word. Where shall you go? You have England before you and you cannot go wrong.

A DOCKSIDE CRANE FOR AN 00-GAUGE RAILWAY

By "The Padre"

A Simple Little Model made entirely from Metal.

THE model dock crane is so simple to make when the use of a soldering iron had once been mastered, that it should be no difficult matter to construct half-a-dozen of these items for adorning the side jetty of a model dock. The method of construction follows closely the several instances already described in this series, such as the three-span viaduct, the skew bridge, and so on. The most important requirement for this kind of work is an electric soldering iron. It is quite hopeless to try to do the job with the ordinary fire-heated tool; requiring to be of such a small size, the iron will grow cold after the soldering of every single point. But the electric iron will maintain its heat quite indefinitely, and will never grow too hot. Considering the enormous number of duties to which this tool can be applied, it is really a very cheap investment.

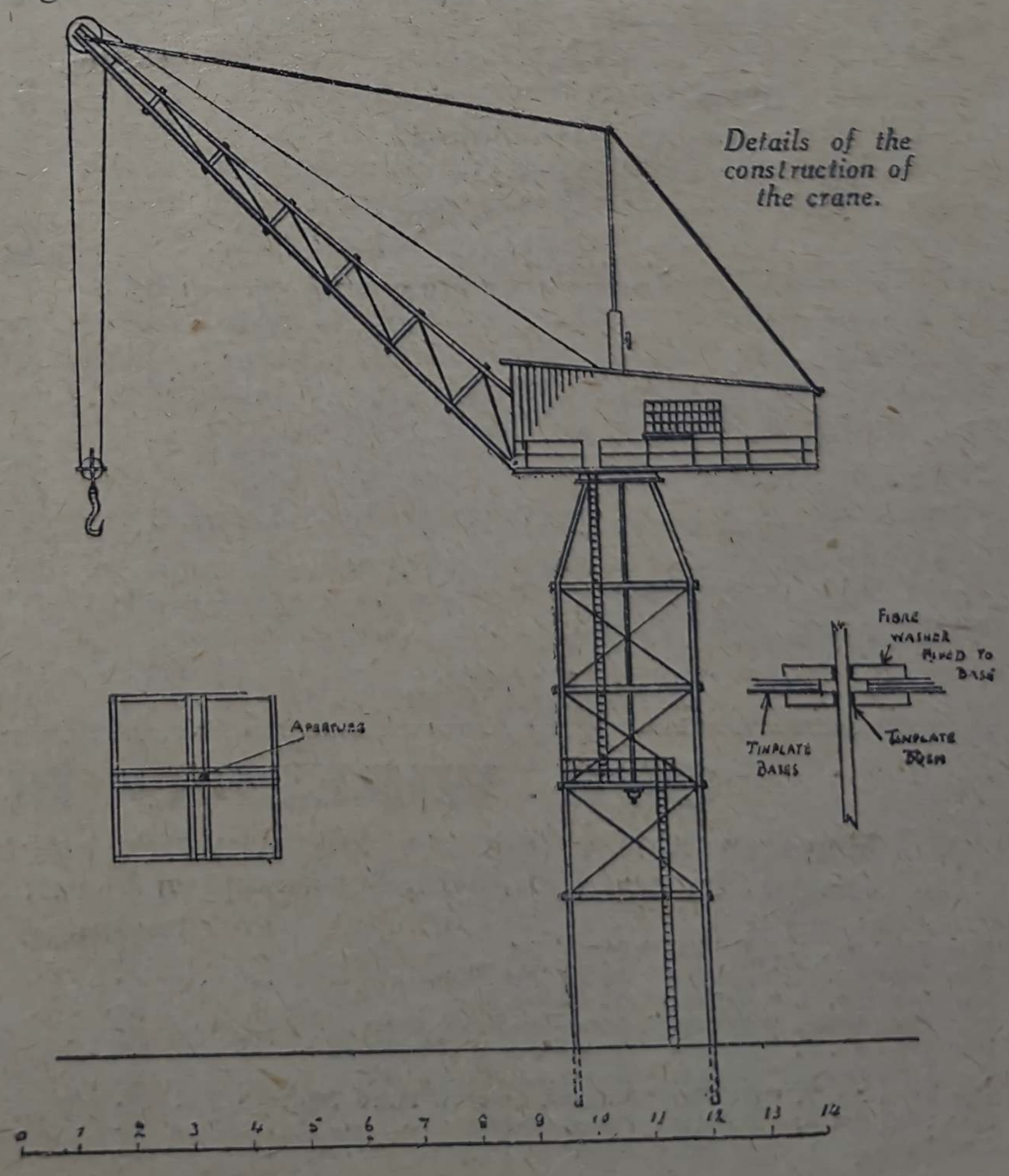
Made of Metal.

The model as depicted is made entirely of metal, the sole exception being the glass window! I began by using square busbar for the upright supporting column of the crane, but after that point had been passed I discarded this very ill-natured material in favour of 00-gauge rail. I would recommend the latter for use throughout. The work is begun by drawing on a piece of cardboard the main rectangular members for one side. This should be done with a squaring instrument, so that everything shall be symmetrical. When the two sides have been made up on this drawing, the diagonals, which are of tinned garden wire, may be put in, care being taken not to melt off the completed soldering work. Solder these on the inside. The two sides finished, they may now be built up into the lattice tower with the aid of a piece of scantling, inserted between them while the cross-pieces are soldered on. These are soldered outside, as shown, all accurately level. The remaining diagonals are then soldered inside, not a very easy matter! Next bend in the four top ends of the uprights to the shape indicated.

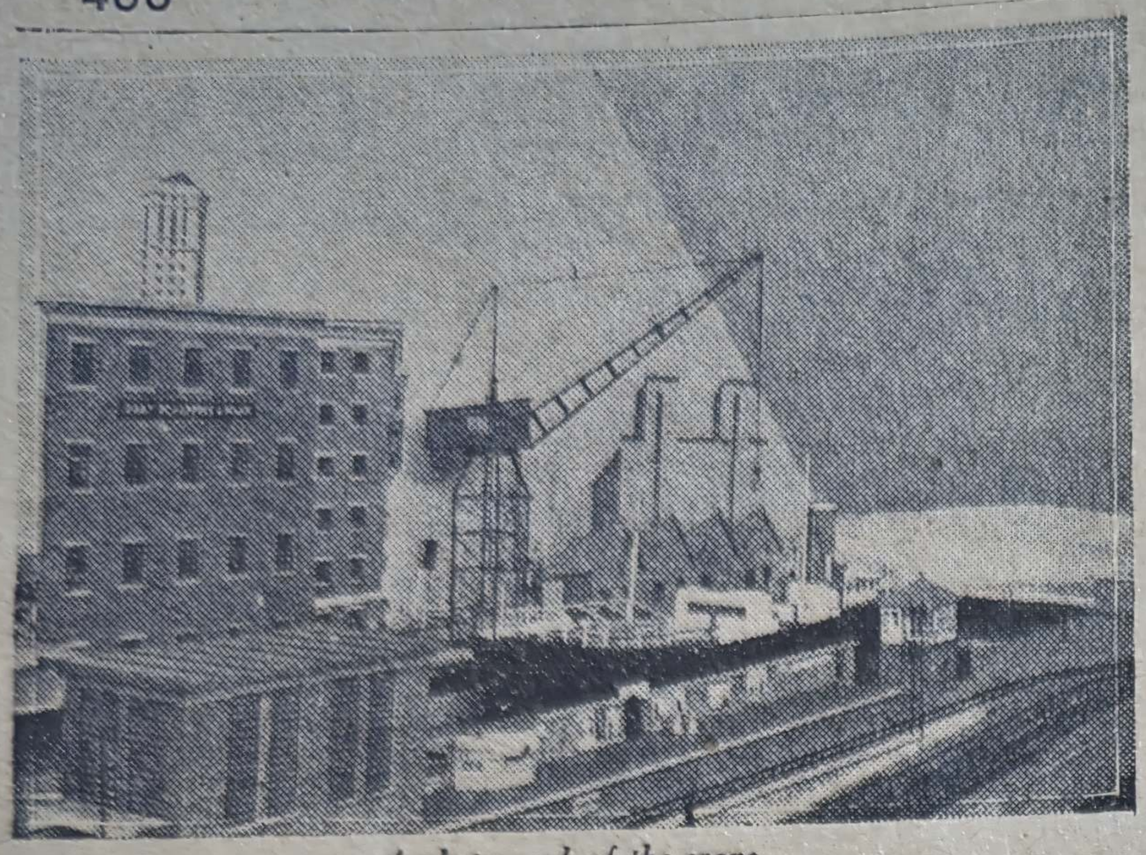
The turntable consists of two small lids taken from discarded pickle bottles, their main qualification for the purpose being the absence of embossed printing and the nicely-rounded edges, as well as their small size, one (by the way) being smaller than the other. A hole was drilled exactly in the centre of each disc, and one disc was soldered to the tops of the tower, the other to the base of the cab, when ready. The remaining work on the tower was that of the ladders and galleries. These were very easily made, with a little patience, in the manner so repeatedly outlined in these articles. The bases of the galleries are of tinplate, the whole being built up separately and afterwards soldered in place. Ladders are soldered perpendicular to the tower sides. There is also a little contrivance for maintaining the base of the pivot. It consists of four pieces of rail soldered as in the small sketch.

The Cab.

This I made from empty flat cigarette tins, bending the corners sharply over a block of iron. For retaining the glass inside the walls I made little metal rebates with strips of 1-16in. brass and $\frac{1}{8}$in. tinplate, soldering these to the walls and afterwards inserting the glass, which should be thin. The sashes are formed of paper strip, which should be painted before the strip is cut—a dark lead colour. The roof has a beaded edge to hold it in position inside the walls, and is, of course, detachable. The middle of the cab front was left open, but was railed across. The cab has handrails only along one side, on a projecting ledge, which has an edge of tinplate turned up. I made the already turned-up edge of the tin lid, reduced in width, serve this purpose.



Details of the construction of the crane.



A photograph of the crane.

The jib is made in the same way as the tower, but is tapered. The cross-pieces of rail were set on at rough lengths and trimmed off later, the whole work, of course, like that of the tower, being cleaned off with a file—a rat-tail one of small calibre. The jib is fixed to the cab by passing through holes in the front, the ends being soldered on the insides of the walls. The pulley, which must run very loose but without wobble, is taken from a 0-gauge signal crank. Its pivot, to which it is soldered, runs in a pair of tiny washers, in their turn soldered to the jib.

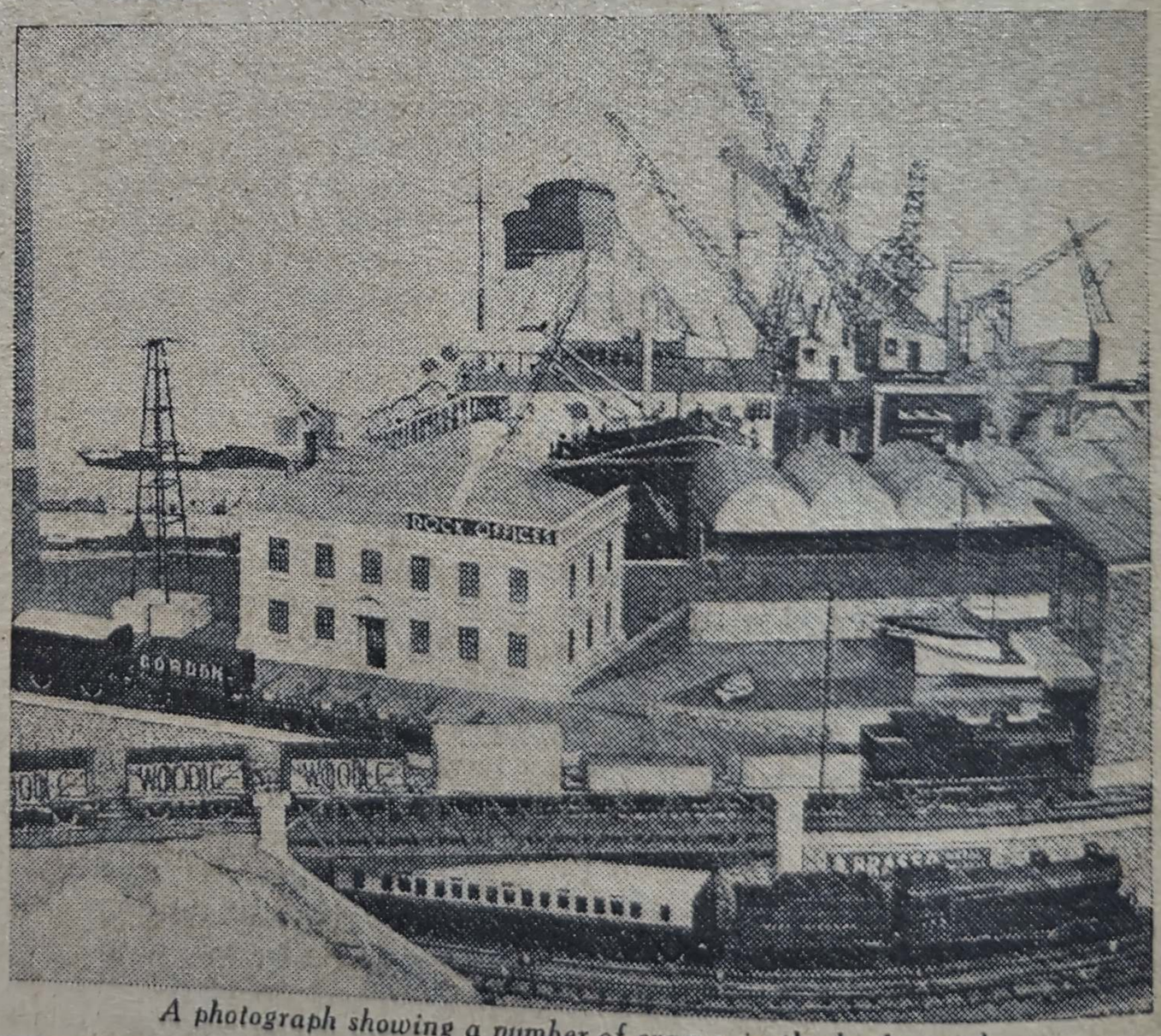
We now have the tower, the cab, and the jib. All that remains is the pivot. This is a knitting needle, or a piece of straight cage-wire. [The latter has the advantage of tinning easily. This pivot passes through a hole in the cab roof, the cab floor, and turntable, and through the aperture in the little square bearings described, near the middle of the tower. At the top there is soldered a cross-piece about an inch long, to which are fixed the wires from the peak of the jib. Other truss wires pass, in one piece, from this cross-piece round the under edge of the back of cab roof. A small brass cuff, with set screw—a wireless fitting which I bought for a penny—is inserted over the pivot as shown. The pivot is cut in two at a point within this cuff, the upper end being soldered to the top of the cuff. The lower end is engaged by the set-screw. It will now be seen that in order to dismantle the crane all that is necessary is to loosen the set-screw, which retains the roof of the cab in position. Do not, of course, omit the small nut in the bottom of the pivot, which may be soldered to the pivot, but not to the tower.

The Gin-block.

The gin-block is a model ship's fitting, and the most costly item in the whole structure! It may be dispensed with if desired, and a plain hook and lead ball substituted. I obtained good lead weights for this purpose from a child's "throw-down" exploder for percussion caps, using the inside lead cylinder after drilling a hole through it. For the hoisting cable, use fine ship's chain, twenty links to the inch.

The crane may be operated in the manner described for the Goliath Crane, by crank and spoked wheel. But it should be an easy matter to fit two of the standard model locomotive motors known as the Bing P-M type. These can be had in parts, and one might be used for the hoisting, inside cab, and another for the luffing, or turning movement, being fixed near the base of the pivot on the inside of the tower. In this case, a small metal shed could be made to house it, and this might, if necessary, project well out from the tower side. Current could be supplied by insulating the pivot from the rest of the crane. A small sketch shows how this, might be done. The positive lead would then be carried to one leg of the tower, and current would thus be served to the positive brush of each motor, these being one with the frames of the crane. The separate control pushes could be set in the negative lead of each motor, which would be brought to the hoist motor through the insulated pivot. The luffing motor, being below the turntable, would require no special insulation the negative wire going straight up the tower to the motor negative brush.

The crane is intended to span a railway track alongside the dock, and its bases are forced into holes in the baseboard. It may be painted lead colour or dead black. Do not use enamel. The photos show the model in place on a jetty of the dock on the West Midland Railway, and were taken by Mr. C. W. Meredith.



A photograph showing a number of cranes in the background.

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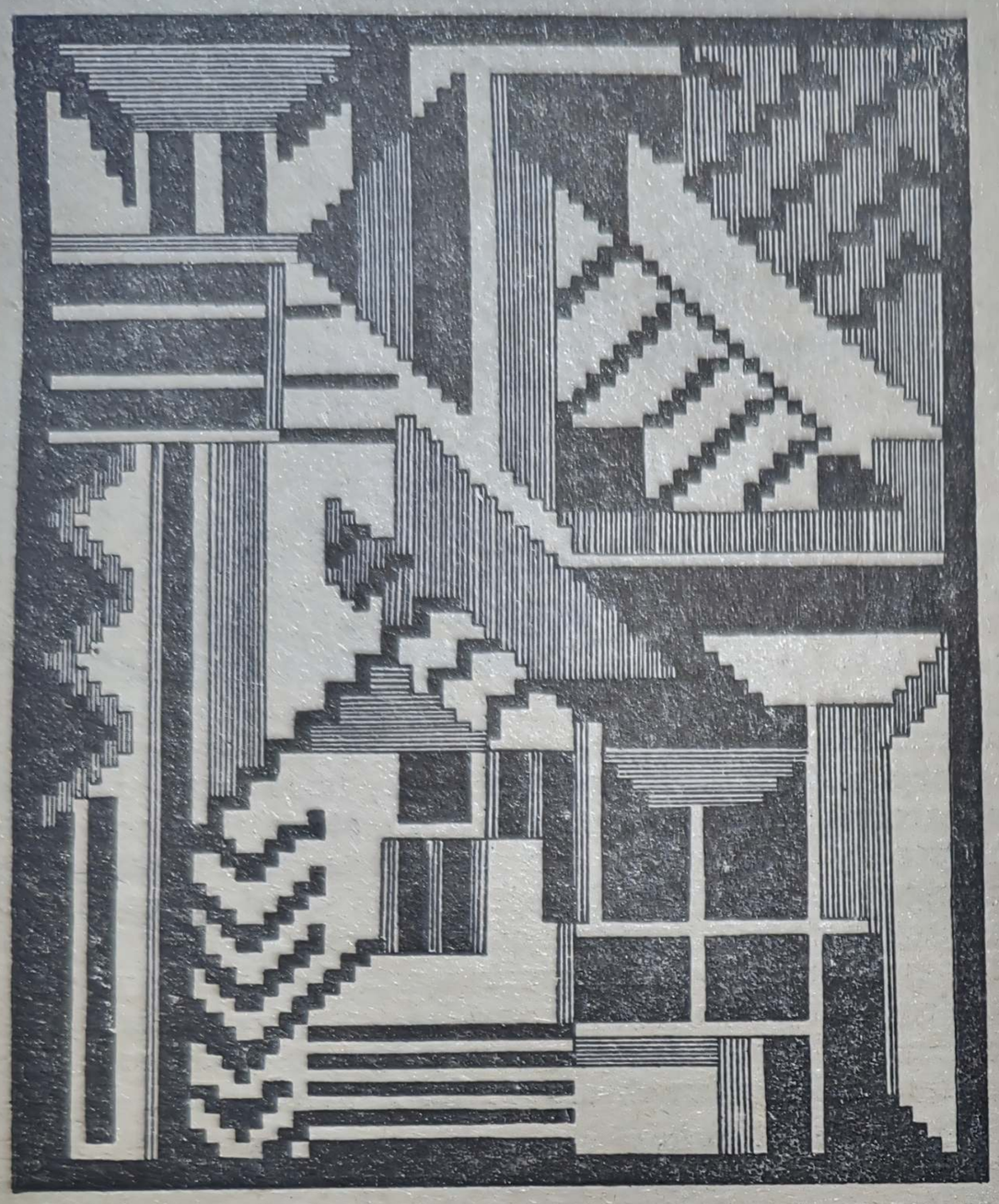


A colour design.

RAFFIA WORK FOR BEGINNERS—Part III

By M. Bywater, A.R.C.A. (Lond.)

(*Concluded from page 466 of last week's issue.*)

How to Make a Waste-paper Basket and a Pochette or Purse-bag on Canvas.

coloured raffia. Line with mauve moiré ribbon or linen. If stiffening is required, insert tailor's canvas under the lining.

In embroidery on canvas, always work from a design planned on the graph or squared paper previously referred to. A pattern drawn in free, flowing lines may lose all former semblance when it necessarily conforms to the mesh. Flat pieces of work can be pressed with an iron of medium heat. This will force up the glossy surface that glycerined raffia gives.

The many lovely shades in which raffia is dyed will appeal to the student of colour, who should also find an outlet for colour sense in appliqué and stencilling. Gesso work is more satisfying to the modeller. Leather work is essentially a study for all with constructive ability, and lino-cut for the student who is interested in line and form rather than colour, and who is eager to learn a reproductive craft.

It has been argued that applied art is only for the few and that any hand-made article can be equally well manufactured. The more discerning will realize that the machine-made article must inevitably lack the qualities which make up a piece of work created to become part of an individual scheme of decoration.

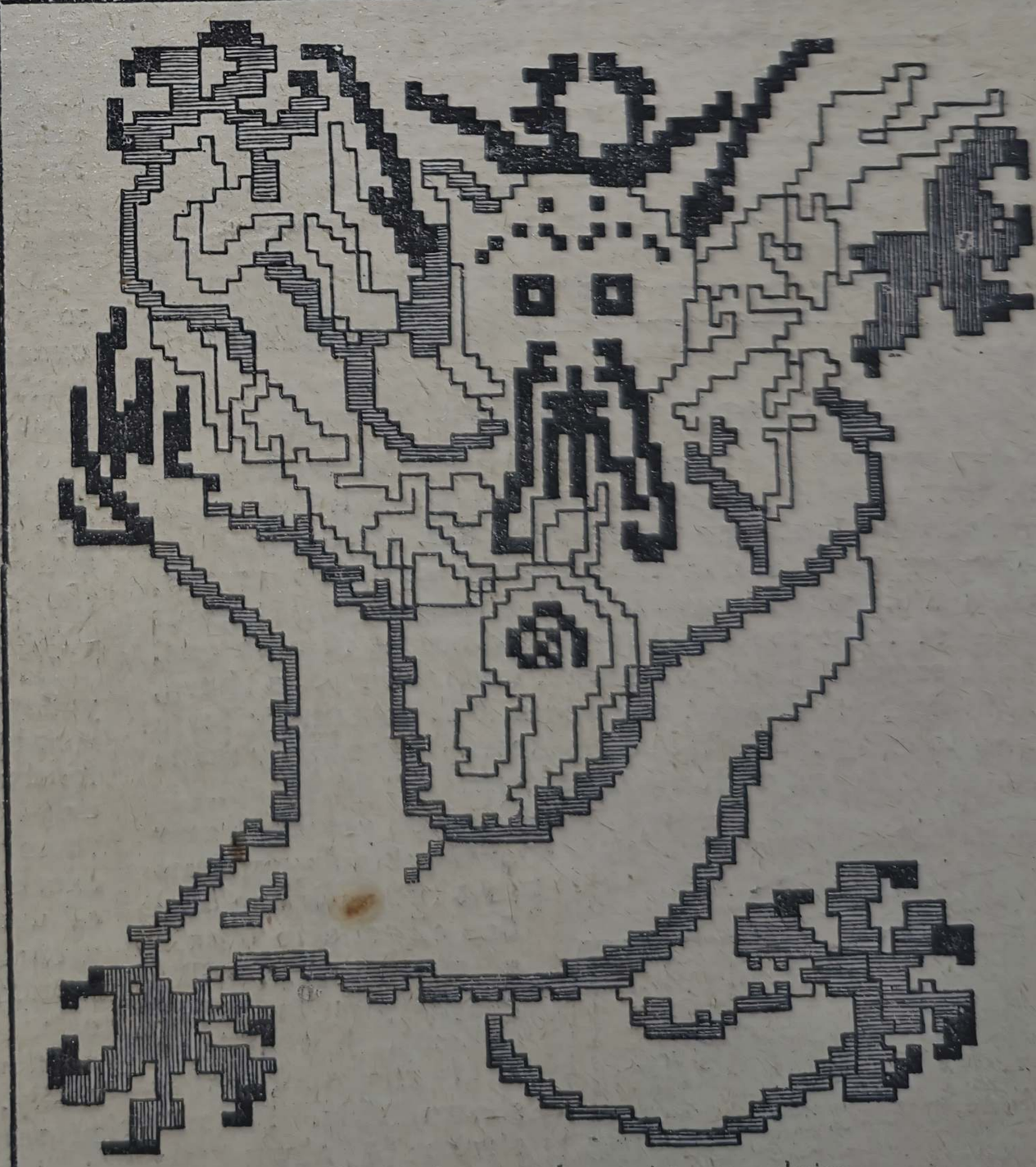
How to Make a Waste-paper Basket in Plaited Raffia.

FOR a basket 12in. deep, having a base 8in. in circumference, about 20yds. of three-way plaiting will be needed. A plait of this length is made up of shorter plaits neatly joined. A cylindrical-shaped basket is easy to make and quite pleasing in appearance. The sides of the basket are carried straight up, each new coil of plait being built up over the previous one and sewn together. To make a fancy edge, add two further rows of plait to the outside of the top edge.

A Pochette on Canvas.

A convenient size for the pochette illustrated in last week's issue can be made from a strip of canvas measuring 9in. by 18in. The margin of 1in. should be allowed so that it can be turned in and oversewn to prevent fraying. Transfer the design and fill in the shapes with the colours in which it is to be worked. The Michaelmas daisies should be in eyelet-stitch, which fills a square with stitches radiating from the centre.

Use stem-stitch for the stalks, block-stitch for the leaf shapes and the textured ground, and the same, in alternating colours, for the border. A satisfying colour scheme would be mauve for the flowers, with blue-green leaves and foreground stitches; a repetition of the mauve in the border. Golden brown or light grey would look well in the alternate border stitches. Either of these colours can be repeated in the flower stems. Fill in the ground with rows of satin-stitch in natural-



A Chinese dragon makes a picturesque design.

WOODCARVING for the beginner

This is the first of a short series written by an expert for the fellow who wants to do carving and does not know how to begin. You will find the articles and the actual work very fascinating.

FROM the very earliest times woodcarving has been a means of decoration. Church fittings, panels of furniture, etc., have always been beautified by the carver's skill. You may have thought that it was too difficult a craft, but these articles show you and guide you through some simple exercises so that after a little practice you may have carving as a medium for decorating your work.

The Tools Needed.

Certain tools are necessary for woodcarving, as in every other craft. A set of woodcarver's chisels and gouges are essential, while two small cramps and a strong bench will be found most useful. A delightful set

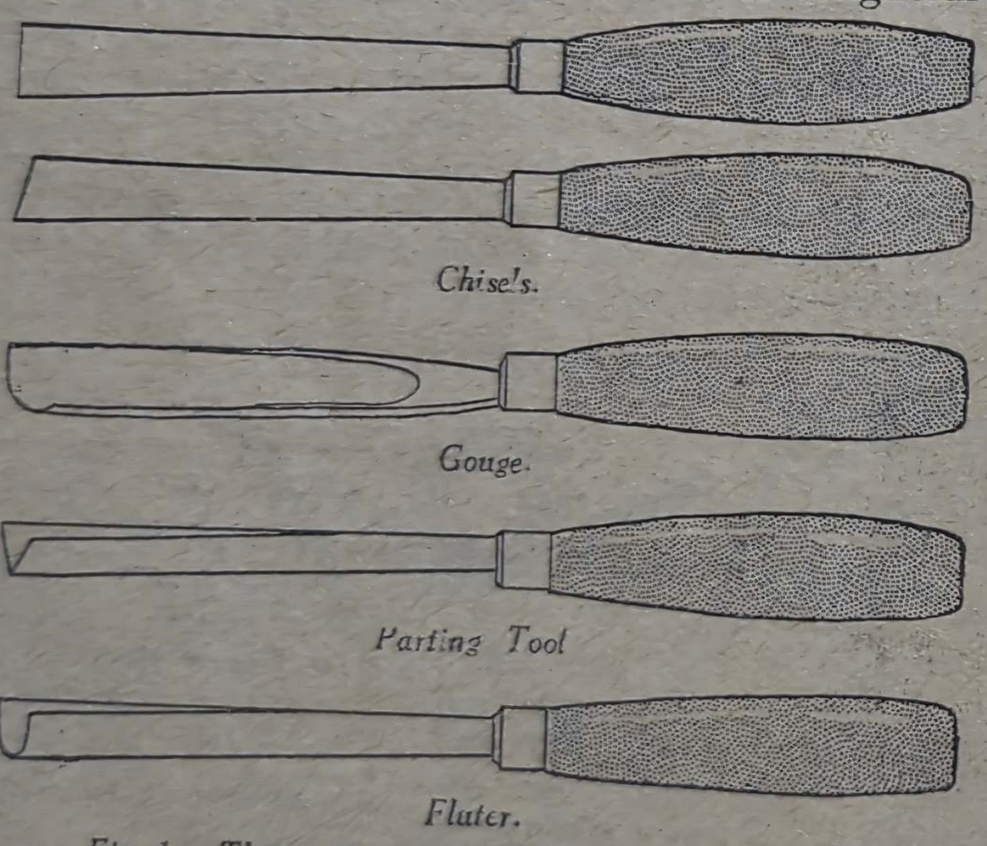


Fig. 1 —The various cutting tools required for carving.

of chip carving tools are supplied by Hobbies Ltd. for 13s. 6d., while if you are more ambitious, a full set of woodcarving tools can be had for 21s. 6d.

Carving tools are divided mainly into two groups, chisels and gouges, and Fig. 1 illustrates the various shapes of these tools and gives the names of each one.

It is essential that you should keep your tools sharp, and in order to protect the edges it is customary for a carver to carry his tools in a cloth wrapper, usually made from green baize, with a compartment for each tool.

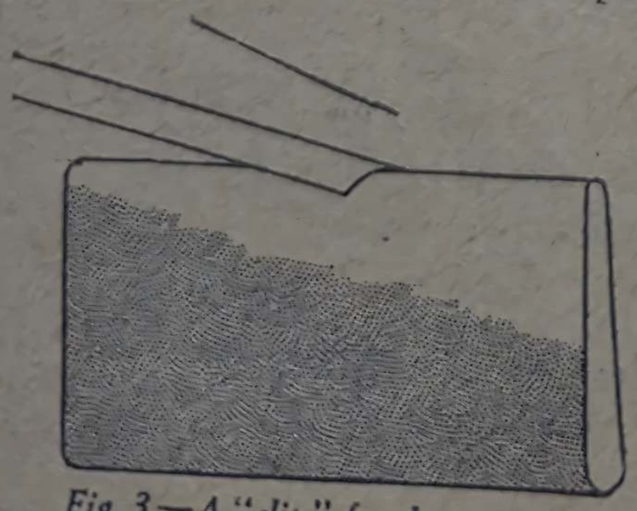


Fig. 3.—A "slip" for sharpening.

If you possess a new outfit of tools you must first rub each one on a fine oilstone to obtain a sharp edge. The gouges you may find difficult, but if you hold the tool as is shown (Fig. 2) and stroke it along the stone a keen edge will be obtained. With the inside gouge it is different; for this a "slip" is necessary. Hold this in your right hand (Fig. 3) and rub till the edge is sharp. If the wood is particularly hard or the work is delicate, it may be necessary to strop the tool after sharpening. A strop can be made quite easily by nailing a stout piece of leather to a piece of wood and coating it with tallow and emery dust.

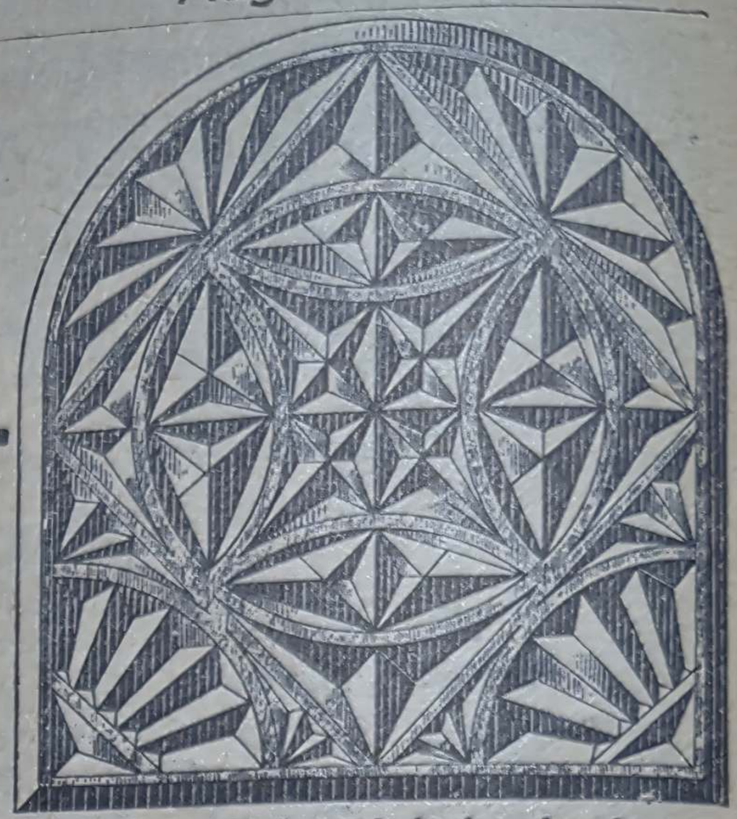


Fig. 6.—A simple book rack end.

It is essential to hold your wood firm while you are carving, and to do this it must be cramped to the bench. Hobbies' all-steel cramps are suitable for small work, and the fretworker's bench cramp for heavier work.

Holding the Work.

You may be fortunate and possess a bench of your own for practical work. If so, you should endeavour to cramp the wood you are working on over the leg of the bench in order to get as much support as is possible. If you have no bench cramp a stout piece of hardwood should be between your work and the table to act as a protection.

A mallet and not a hammer is used to hit the carving tool, and although there is a particular type of mallet used by carvers, it is not necessary for you to get one. An ordinary carpenter's mallet will suit your purpose very well, and Hobbies now supply a special small one for 4½d.

The Wood to Use.

As you know, woods have particular qualities. They may be hard, soft, coarse or spongy, and each wood is usually suited to a particular purpose because of these qualities. So it is with carving. A wood with a good close grain and one that is not too hard and is free from knots is the wood that the beginner should use.

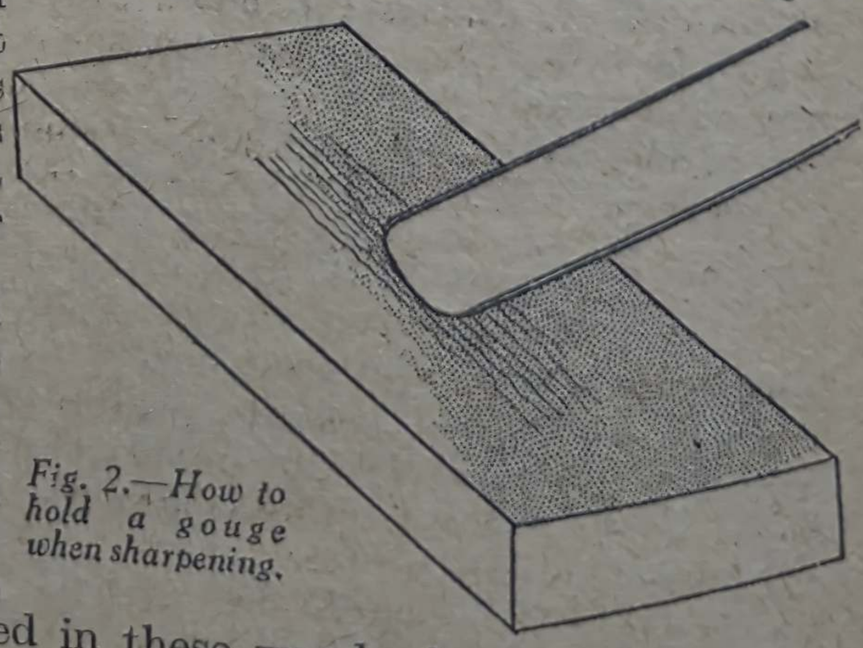


Fig. 2.—How to hold a gouge when sharpening.

Lime and yellow pine are woods used extensively for carving, and there are many excellent pieces of work executed in these woods, but white chestnut, sycamore, oak and satinwood are also to be recommended. These are reasonably soft, except perhaps oak, which is included because it is best suited for outdoor work, and although a hardwood works very easily. These woods can be obtained in various thicknesses and are supplied by Hobbies Ltd.

It is wise, also, for the beginner to know something about the type of design that is suitable for carving.

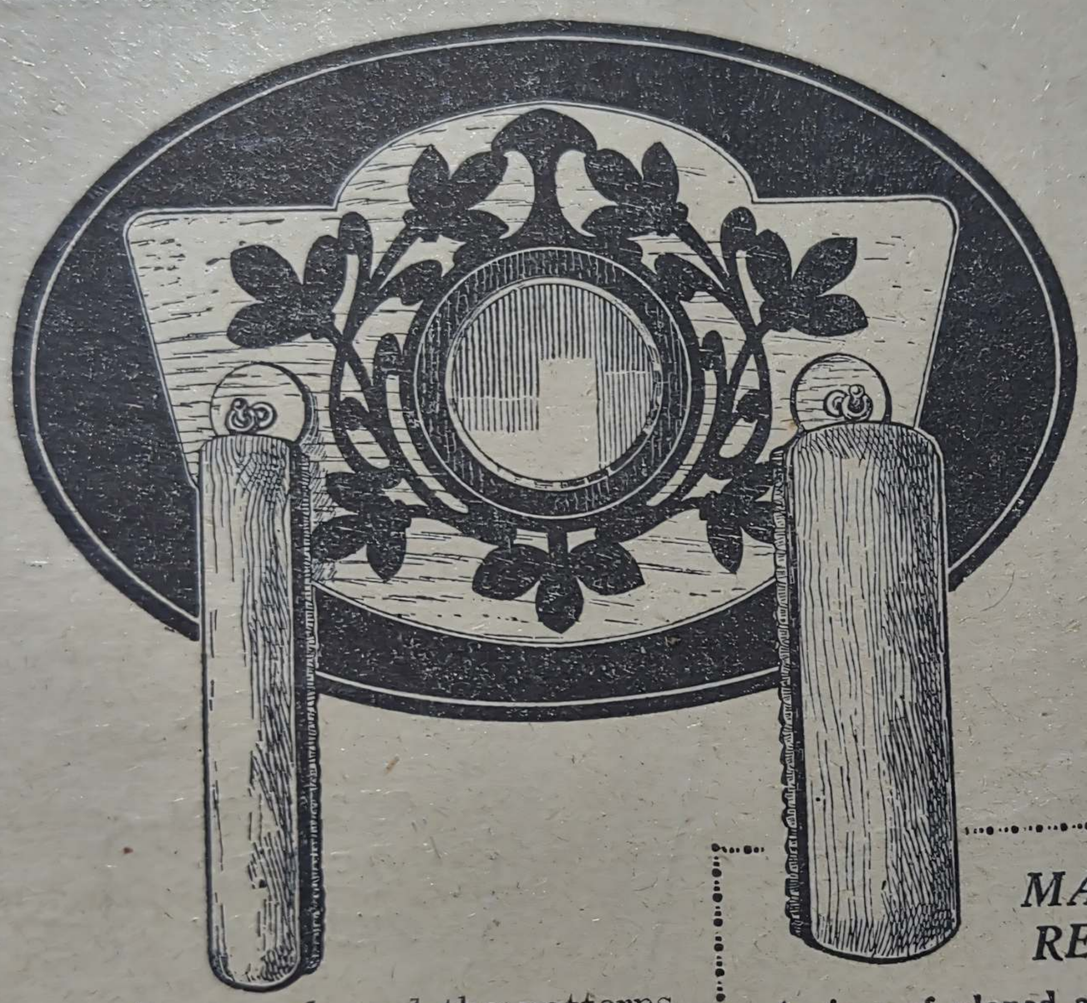
(*Continued on page* 494.)

A Brush Rack in FRETWORK

See the patterns on the centre pages.

ANOTHER useful piece of work can be completed this week from the patterns illustrated in full size on the centre pages of this issue. They give the opportunity to the fretworker to spend a very happy couple of hours, and at the same time employ his leisure with profit. Such a piece of work as illustrated forms a useful as well as ornamental article for the hall, and can be thoroughly recommended as a present for a friend either for such an occasion as Christmas or a wedding, or a birthday.

The cost is quite small, and if one has not the fretwood at hand, it can be easily obtained as a complete parcel, as shown on the sheet. The work indeed is quite straight-forward, and consists only of the two main pieces—the back and the overlay—and one or two incidental pieces.



Almost any fretwood is suitable, and a piece $\frac{3}{8}$in. thick is required for the main back, which is shown in outline on the pattern. The overlays are cut from $\frac{1}{8}$in. wood, and the patterns themselves can be pasted down direct, or a tracing taken off in the manner usually recommended. In any case it will probably be advisable to trace off the outline of the main back, which is the single shaped line clearly seen. Transfer this to the wood by turning the tracing paper over, or putting a piece of carbon beneath it.

The Better Way with Patterns.

If one attempts to use the printed pattern the interior fretted piece must be cut out in the paper, and it will be found that this will considerably weaken the rest of the sheet and make it awkward to get down true on to the wood. Tracing off the outline, therefore, is to be recommended. Get the grain of the wood running crossways to provide the strength, and indicate lightly the position of the small circles of wood which form the foundations for the two hooks.

The Machine Worker's Advantage.

The outline of wood can be cut in the usual way with the fretsaw, care being taken to maintain an upright blade. This, of course, is always one of the troubles of the handframe worker, but the machine worker has the big advantage, because, as his sawblade is fixed in rigid arms, it cannot get easily out of true in cutting. The back itself is one solid piece of wood, and the whole thing can be cleaned up in the usual way with sandpaper. Use a fine grade of paper to finish off so the wood is not scratched.

The Main Fret.

Then pass on to the actual fretwork of the main overlay. This is in $\frac{1}{8}$in. wood and again with the grain running across. The sweeping curves of the stems and leaves can only be obtained if care is taken in the cutting, and in doing this it is important to note that where the parts cross over each other they should disappear and reappear in correct alignment. It spoils the whole effect if the stem reappears from behind a cross portion at a totally different angle or place.

Be careful, too, to get the joining necks of the various parts exactly as given on the pattern, and to balance each other on each side. Do not carry the saw too far, nor yet stop it off short too early. These acute angles are best made by having two or three drill holes so the blade can be withdrawn and turned round in the hole required for cutting.

Have a fine blade for this, and where acute angles arise in the pattern, do not attempt to turn the saw round at the bottom. These acute angles require practice, and it is equally essential to hold the wood down firmly to the table, otherwise it is apt to jump and the part may get broken and the whole thing spoiled.

Cut out the central circle which holds the mirror last, and before doing it have the actual piece of glass at hand, and lay it in position. You will then be sure that the opening is large enough for it. If not, draw a pencil mark round the mirror itself and cut to this line. On the other hand, do not get the mirror opening too large, or the glass will shake.

Cleaning the Work.

Lay the cut out part flat on the bench and clean up carefully with sandpaper. Be sure to use the paper on a block of wood, or, for preference, one of the special Hobbies blocks supplied with a handle. By keeping the sandpaper on the wood flat there is less likelihood of tearing up the projecting parts and breaking off any delicate pieces.

(*Continued on page* 494.)

MATERIALS REQUIRED

A piece of planed and nicely grained oak, with padouk for the overlay, is required, and it can be obtained ready to cut out for 1/6. The circular mirror (No. 5712) costs 6d., a pair of wall hangers 2d., and a well-made hat and coat brush with hooks and eyes complete is 3/-. The postage on the wood is 6d., and 4d. on the fittings, but is only 6d. on both if ordered together.

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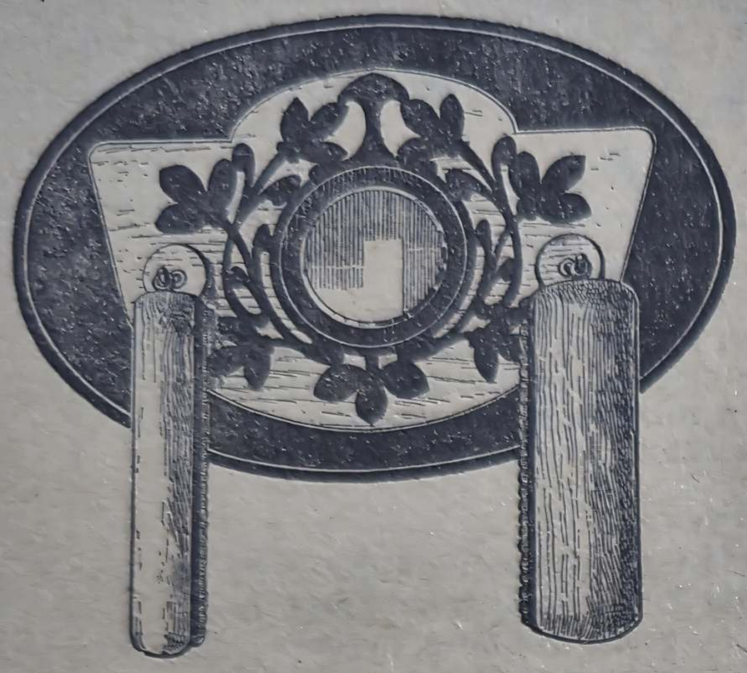
Design No. 1974

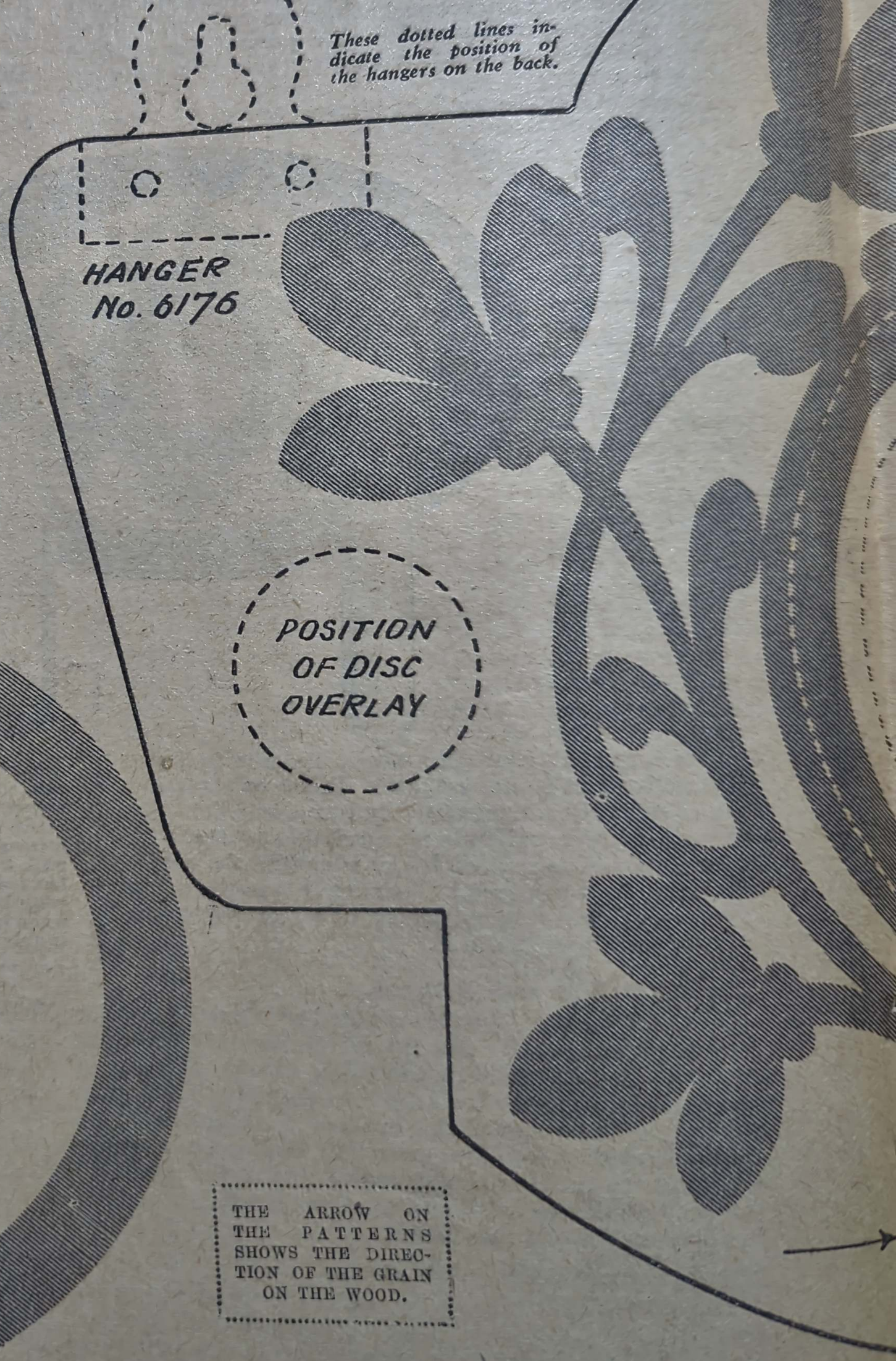
HOBBIES

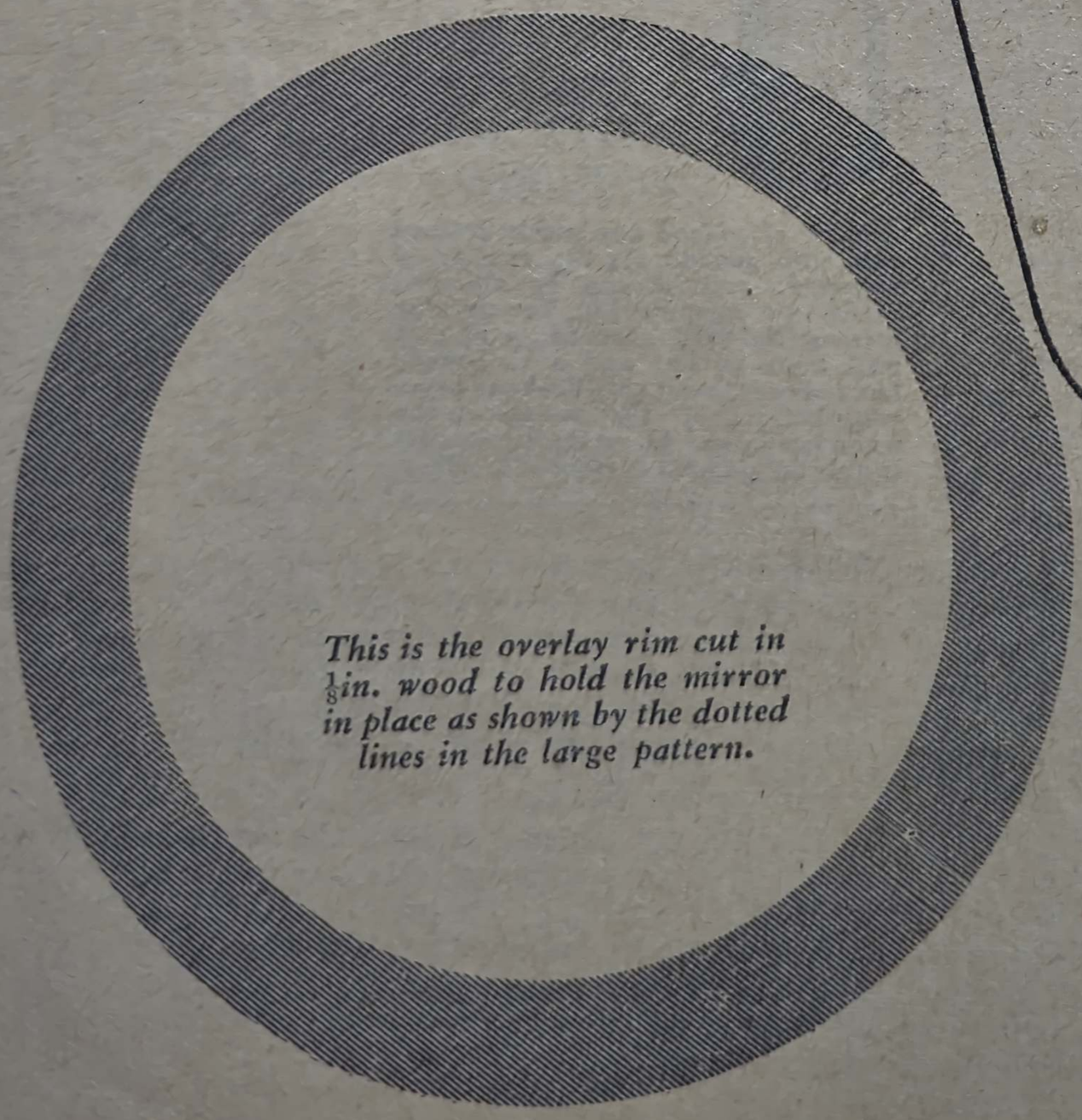
HOBBIES FRETWO HAT AND CLOTHES



MATERIAL REQUIRED

A special parcel of good quality fretwood is supplied for making this article. It consists of oak for the background and brilliant padouk for the overlays. The parcel (No. 1974A) costs 1/6 or 2/- post free. The mirror is a plain circular one (No. 5712) and costs 6d. The suitable brushes are of good quality and are supplied complete with screw hooks for hanging, price 3/- the pair. Two brass hangers for fixing to the wall are 2d. the pair. A complete parcel can be obtained for 3/6 post free, if desired.

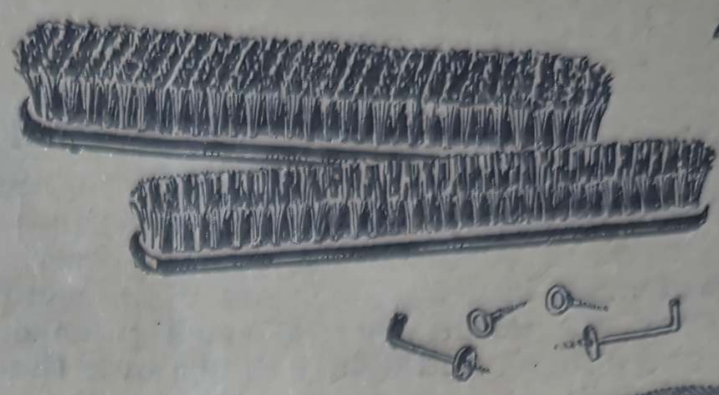


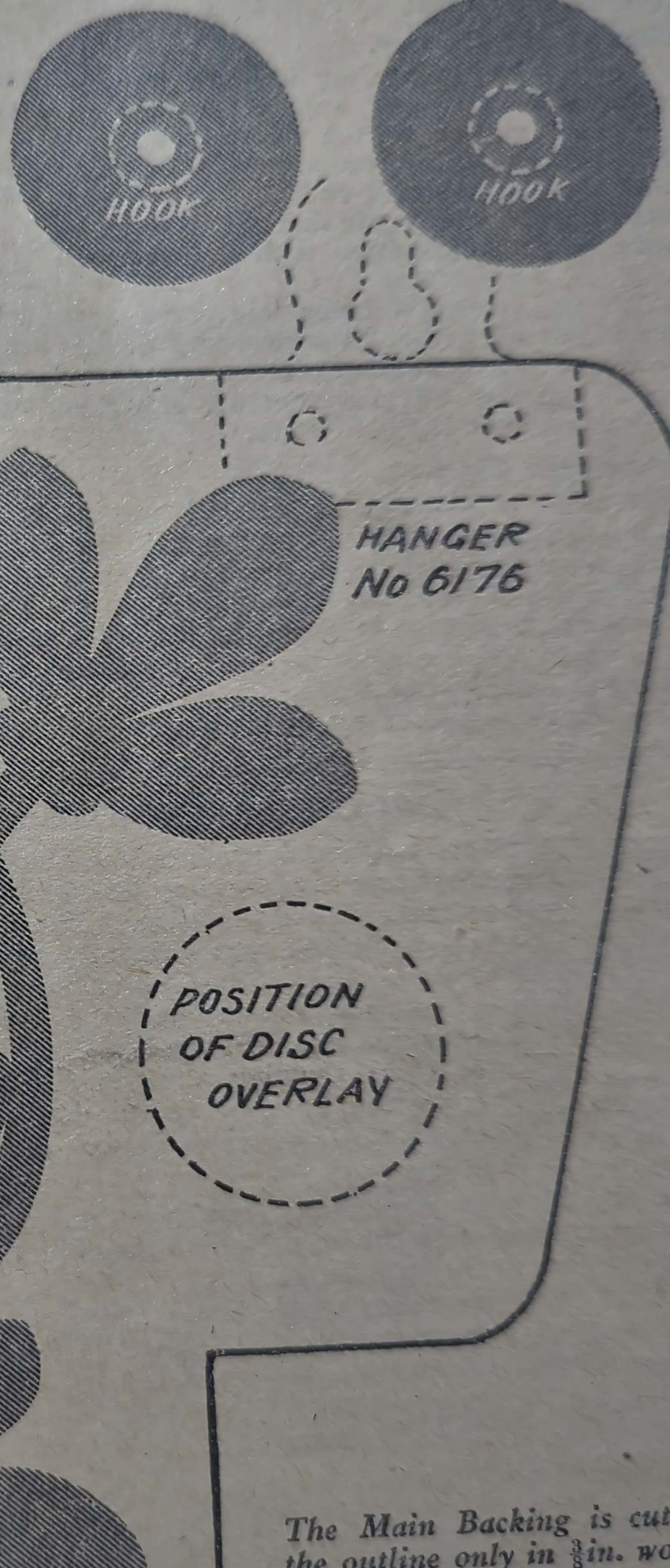


This is the overlay rim cut in $\frac{1}{8}$in. wood to hold the mirror in place as shown by the dotted lines in the large pattern.

THE ARROW ON THE PATTERNS SHOWS THE DIRECTION OF THE GRAIN ON THE WOOD.

VORK DESIGN
ES BRUSH RACK





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The Main Backing is cut to the outline only in $\frac{3}{8}$in. wood. The pattern in the centre is the overlay, and is cut in $\frac{1}{8}$in. wood and afterwards glued on the back in the position it is now. The dotted lines on it show where the mirror overlay is fixed.

A BRUSH RACK IN FRETWOOD (*continued from page* 491)

Having cleaned the front, turn the piece over and give a rubbing here because a sawblade is sometimes likely to tear the wood at the back and create a burr. This burr of wood must be taken off, and if the sandpaper used flat does not do it, then a small piece can be wrapped round a finger and lightly drawn over the edges of the fretted work.

Glue on the Overlay.

The completed overlay is glued on centrally to the main back previously cut. Apply the glue thinly to the back of the fretted overlay, and see that it does not squeeze out over the edges when the part is fitted on. Lay the overlay first in place before putting the glue on it, and mark off its position with a light pencil in two or three places.

This will ensure it being laid down again when the glue is put on without the necessity of moving it over the wood. Have another piece of wood ready to lay on top, and cramp the parts together or weight the whole thing down until the glue is set.

Holding the Glass.

The piece of glass in the central opening is a circle 3in. in diameter, and the one supplied by Hobbies is No. 5712, which just fits in position. It is held there by a $\frac{3}{8}$in. rim of wood cut from a $\frac{1}{8}$in. board. The grain of this part should be in the same direction as the rest of the work, and the piece is glued in position after the mirror has been laid in.

Test these two pieces out before gluing on the rim, and if it is found the glass is loose put a piece of cardboard in the back or pad it out with blotting paper until the glass is pressed close up to the rim overlay which holds it in position.

HOOK AND EYE FOR HANGING BRUSHES

The Hook Discs.

The only other remaining work is the addition of the two 1in. circular discs which form the substance for the hooks. These discs are $\frac{3}{8}$in. thick and the front edge can be rounded off nicely if necessary to make the thickness less apparent. Glue them in position $\frac{1}{2}$in. from the outer end, and $\frac{1}{2}$in. upwards from the straight ledge. See they are properly glued on before driving in the screws of the hooks.

Specially suitable brushes with the necessary hooks are supplied in connection with this design, but it will be necessary to purchase two small brass hangers for fixing the whole thing to the wall. These hangers are No. 6176 from Hobbies, and are screwed on behind the back a little way inwards from each end as indicated by the dotted lines on the pattern.

A Suitable Finish.

The whole thing, of course, should be finished with a coat of stain and polished in the usual way, and it is advisable to get the colour down to the same shade as the back of the brushes themselves. On the other hand, a more striking effect is obtainable if the overlay is darkened a good deal more, but if this is to be undertaken, it is advisable to do the work of staining before the overlay is glued in place.

WOODCARVING FOR THE BEGINNER (*continued from page* 490).

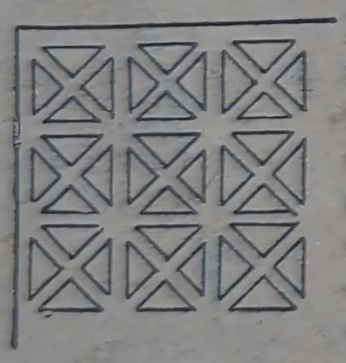


Fig. 4.—A simple pattern.

It is a usual practice for the novice to begin by carving leaf and flower forms. This is wrong. You cannot copy nature; you can only adapt its shape. Figs. 4 and 5 give some ideas of simple repeat patterns for chip carving, but Hobbies' Eclipse Book of Chip Carving designs contains a collection of very useful designs, the carving of which will be discussed later.

One should also remember that the design must in no way interfere with the usefulness of the object. It is wrong to carve the top of a table if it will interfere with its use; carve only where you think a little decoration is necessary, but always be careful not to overdo it. Do not carve for the sake of carving.

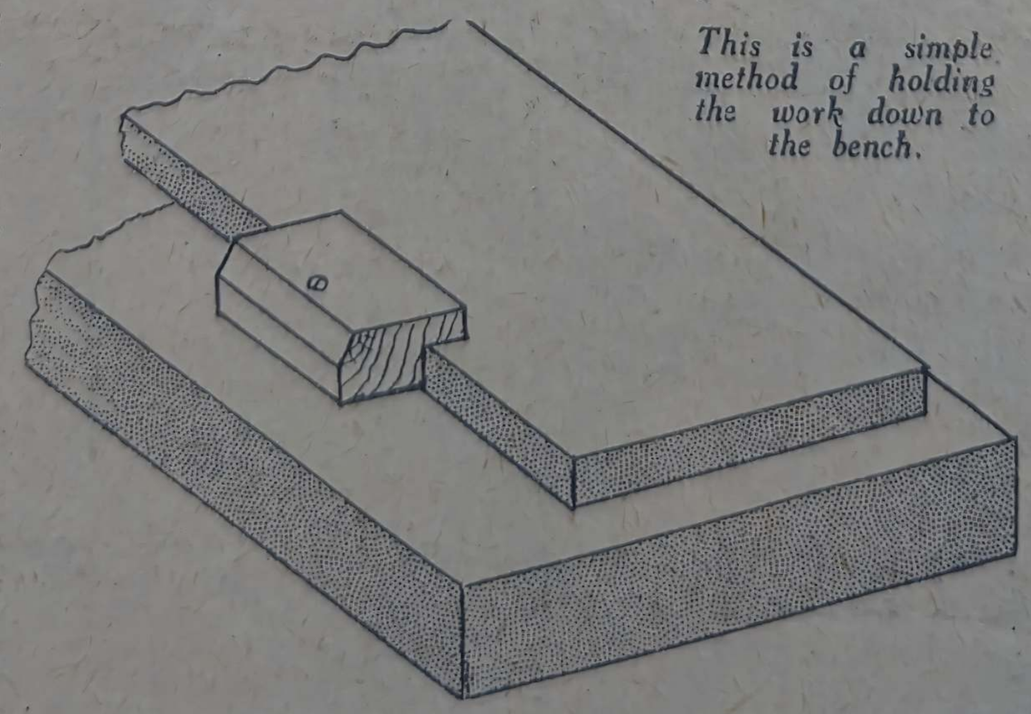
An Example.

For a simple example we can take and describe the process of transferring Hobbies' chip carving design for a bookslide end. The wood necessary for this is $\frac{3}{4}$in. or $\frac{5}{8}$in. satinwood, and the design is copied on to the wood by tracing through blue carbon paper. Take great care not to move the paper while doing so and also endeavour to get one firm outline, avoiding any faults which may mislead you when carving. You should then pencil in that part of the pattern which you do not cut away. This you will find a useful help.

Chip Carving.

The simplest form of carving is known as chip carving. This is usually limited to geometrical forms, but although it is considered elementary and is perhaps the oldest form of carving, it nevertheless gives very useful decoration and is a test of one's patience and skill.

The procedure of carving this bookslide end will be dealt with in the next article. The book of 21 different designs from which it is taken is obtainable from Hobbies Ltd. for 1s. 1d., post free.



This is a simple method of holding the work down to the bench.

In preparation for the work transfer the design on to a piece of wood and get your tools sharp.

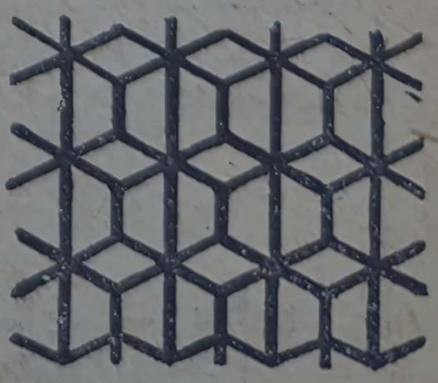
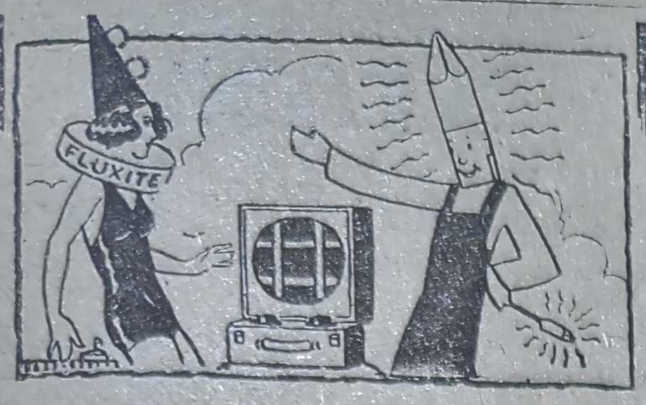


Fig. 5.—Another straightforward design.

Write to Hobbies Ltd., Dereham, Norfolk, for details of wood, designs, tools, etc. suitable for Carving.



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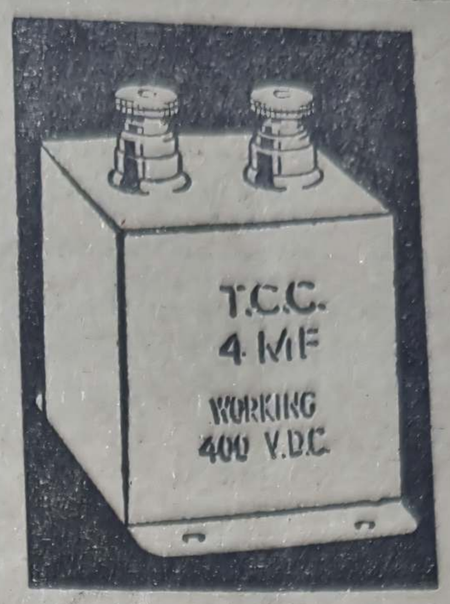

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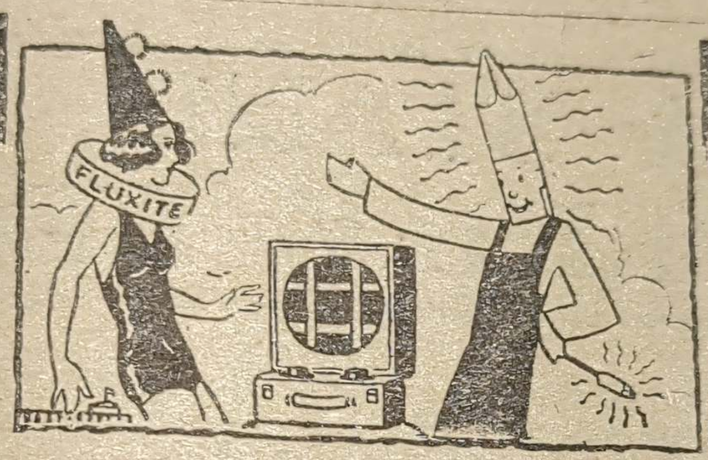

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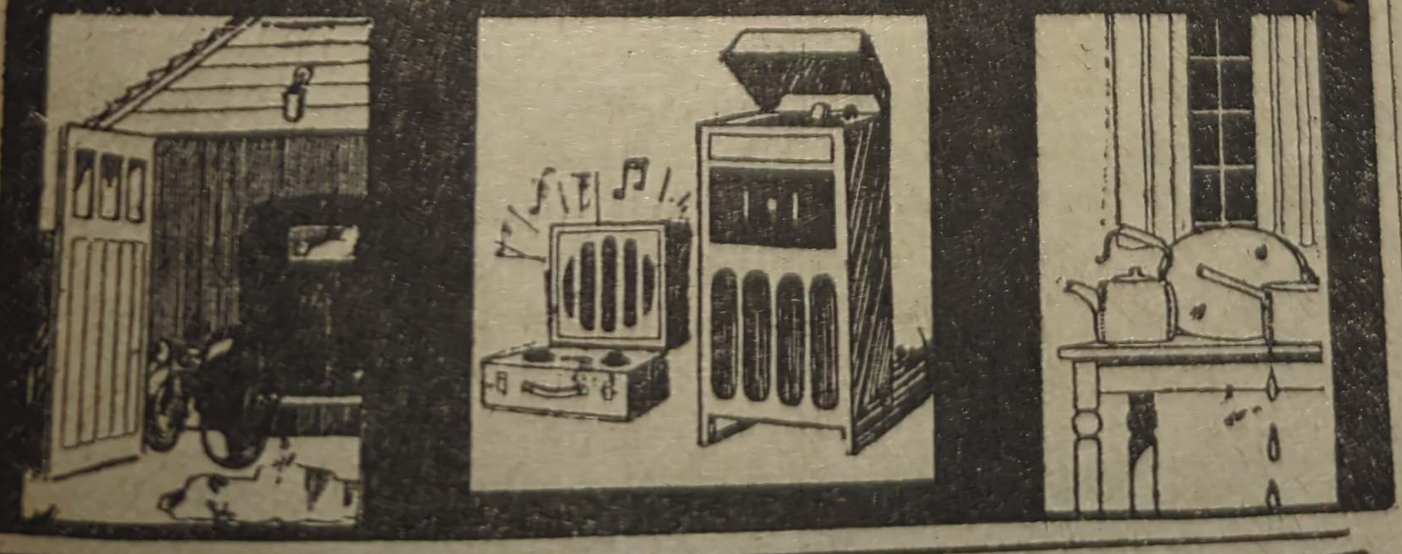

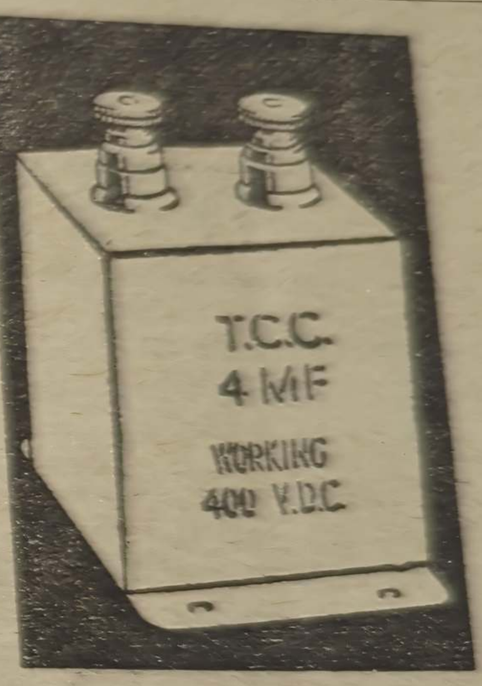

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A PLANT STAND WITH CABRIOLE LEGS

THE lines and beauty of the cabriole leg appeals to almost everyone, and it is surprising that the amateur does not make more use of them, seeing it is possible to obtain the leg in various sizes ready prepared. Here we show a set of cabriole legs incorporated with good effect in a plant stand of the dwarf type so useful in the home, and which could very appropriately be in mahogany.

The stand is 1ft. 10¾in. high, and large enough to hold a plant in anything up to a 9in. pot. Although the completed article will look so artistic there is really nothing difficult in the work, and any amateur who is prepared to approach it with an ordinary amount of care will find it quite simple. Fig. 1 shows an elevation and gives the principal dimensions, and Fig. 2 illustrates the way to set about the job.

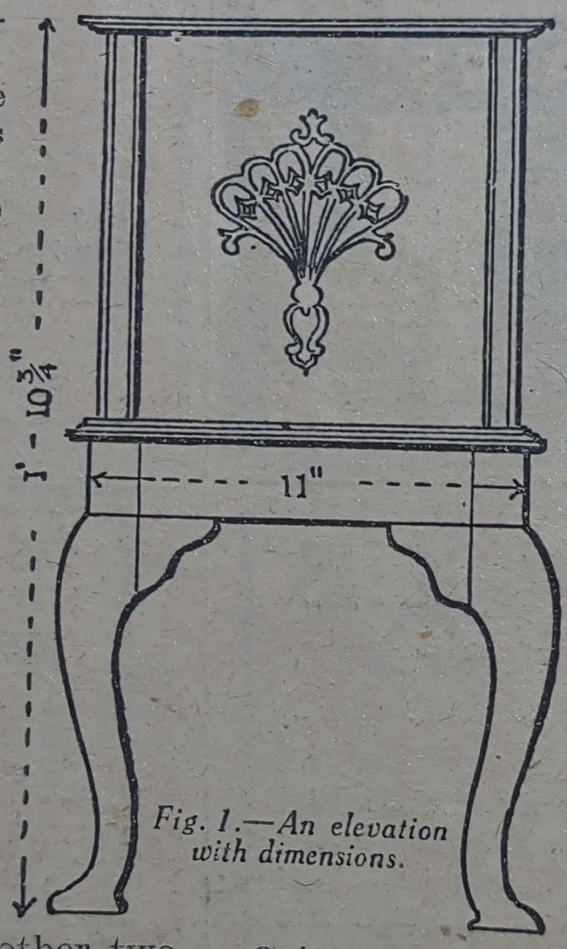


Fig. 1.—An elevation with dimensions.

Cabriole legs of varying sizes are shown in HOBBIES Handbook, and those selected are pattern No. 513D, 12in. long, 10in. shape. Four rails of ¾in. mahogany, 9in. long by 2in. wide, are required to frame the legs, and another piece 9in. long by 2in. wide to cut the curved ear pieces. Two sides of the box are 10in. long by 10in. wide, and the other two, 10in. long by 9¼in. wide of ⅜in. mahogany.

The two rails in the bottom of the box are 9¼in. long by 2½in. wide by ⅜in. thick; while 4ft. of corner moulding, No. 300, with ¾in. sides, is required to finish the corners; 4ft. of moulding, No. 41, 2in. wide by ⅜in. thick, the bottom edges; and 4ft. of moulding, No. 42, 1½in. wide by ¼in. thick, the top edges. A ¼in. dowel rod will be needed to furnish the dowel pins, and an ornamental fret, No. 821, is used to ornament the side.

The legs, of course, are the parts needing care, but once the positions of the dowels have been accurately set out the rest is simple. The rails should be cut just long enough to bring the width over the legs when the rails are fixed between them to exactly 11in., and the ends must be perfectly square.

The method of forming the dowel joints is clearly illustrated at Fig. 3. The positions of the dowels must be carefully marked on the rails and legs with a square and marking gauge. Holes of a size to allow the dowels to fit tight are bored in these positions with a brace and centre or screw bit for a depth of about ¾in.

The dowels are glued into the rails, and when dry, the rails are glued into the legs, in pairs first, and then to complete the stand. It will be desirable to cut and glue small ear pieces between the legs and rails to form a nicely curved finish.

The box is simply made, the four sides being glued and nailed together, and the corners finished with the special corner moulding. The bottom edges of the box are surrounded with moulding No. 41, mitred at the corners, while the bottom itself is formed by fixing two rails across between the sides to rest on the moulding as shown at Figs. 2 and 4.

A finish for the top edge is obtained with the moulding No. 42, which is mitred around level with the inner edges of the sides. A few screws driven through the bottom moulding into the leg rails will fix the box to the legs, and with the fixing of the fretted ornament the stand is complete.

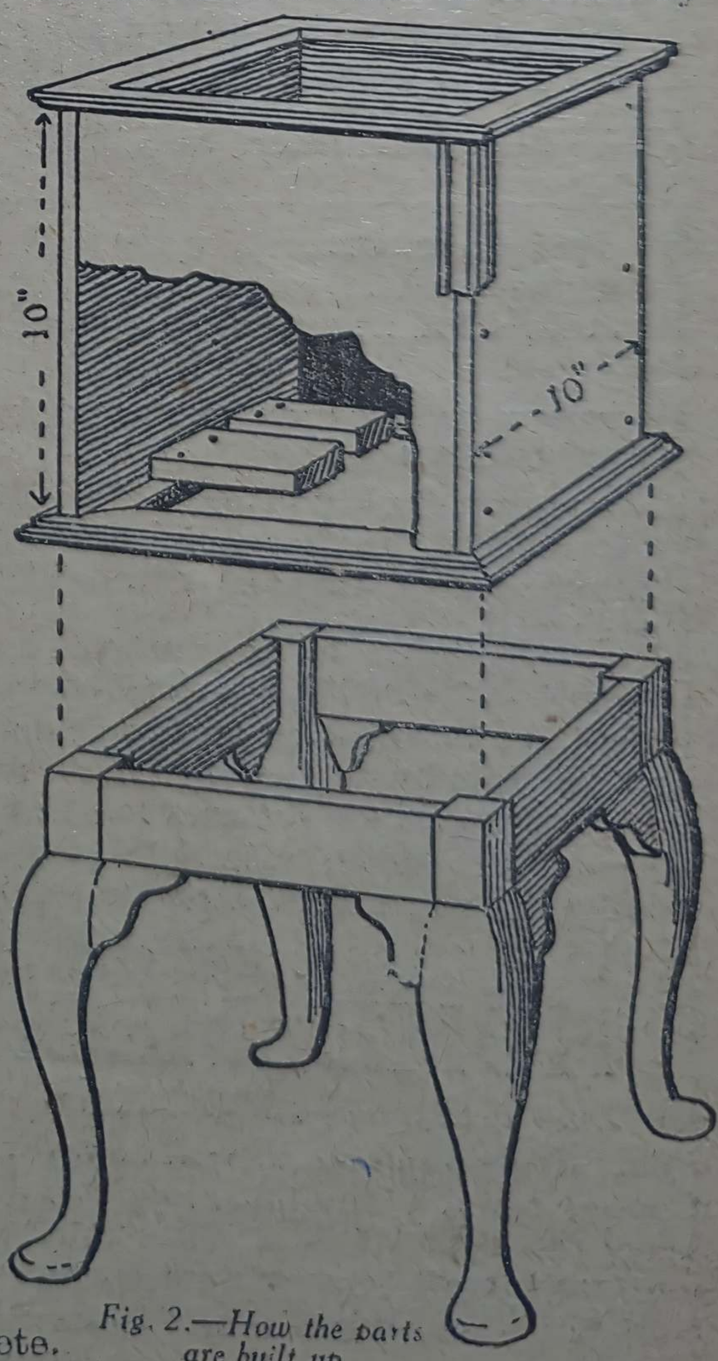


Fig. 2.—How the parts are built up

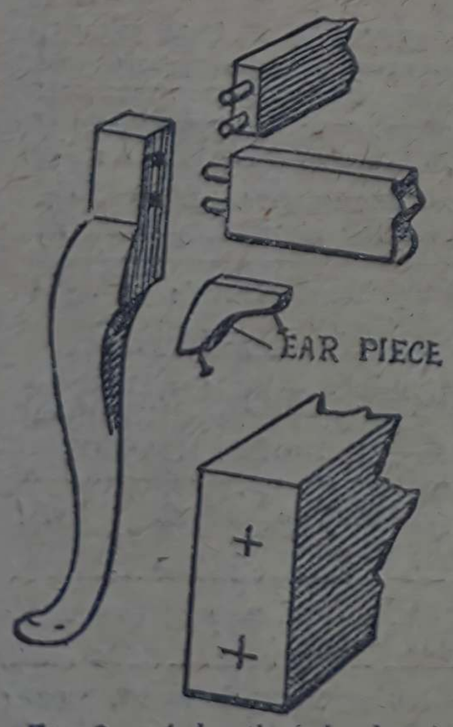


Fig. 3.—A detail of the dowel joints in the legs.

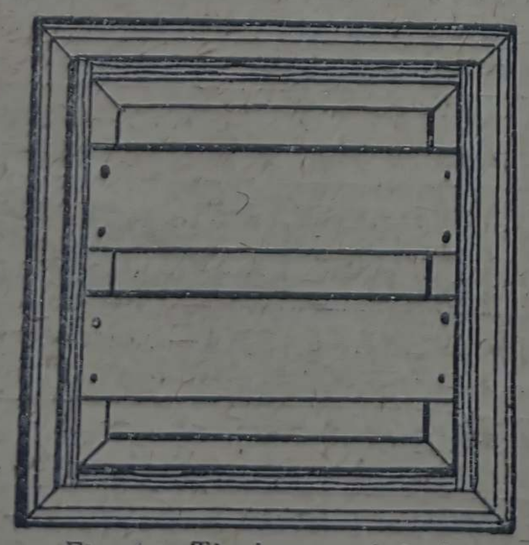


Fig. 4.—The bottom of the box.

COPYING WITHOUT A CAMERA

By S. J. Garratt

An Ingenious Idea for Copying Articles from Books without Spoiling the Book.

AT first sight it would appear essential to use a camera for copying such subjects as the page of a book by photography, but by making use of the method described below such work can be done without camera or plates. This is called the "Playertype Process," after the name of its inventor; it is very useful for copying articles from a book, thus avoiding the work of writing out the copy, or else cutting out the article and spoiling the book. You may, for instance, copy an interesting page from a library book; it does not matter if the paper is thick or thin, or whether it is printed on both sides. Illustrations can be reproduced as well and it is possible even to copy photographs, although the results are not likely to be as satisfactory as a proper camera copy in such a case.

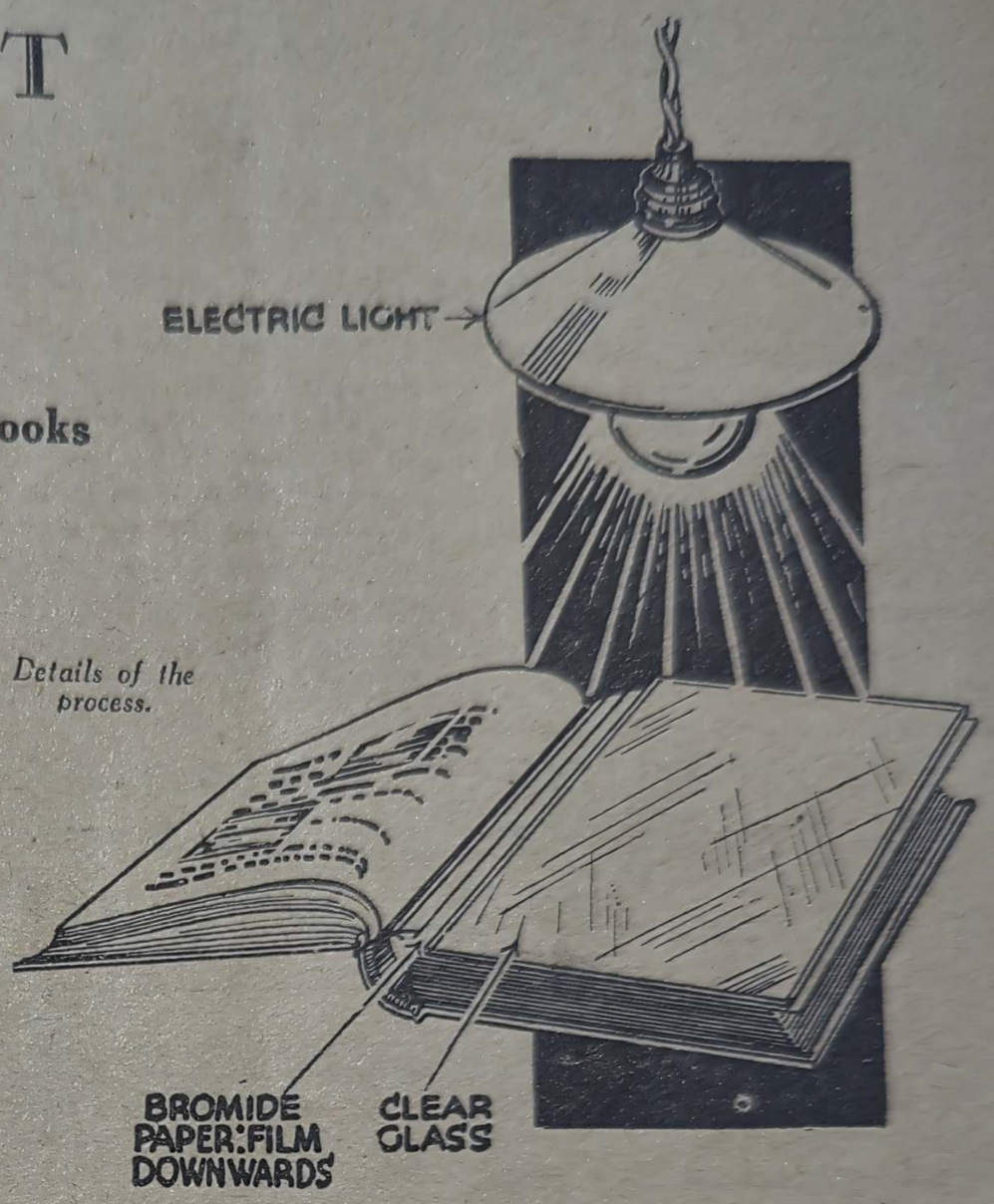
As we are not making use of dry plates for this process we naturally require some other light-sensitive material and for this purpose bromide paper will be needed. The most suitable for this work is "Ilford Photo-Mechanical Paper," which has a very contrasty sensitive film on thin paper. This paper is not usually stocked by photographic dealers, but they could probably obtain a supply to order. Alternatively, any constrasty grade of bromide paper will give reasonably good results if the paper itself is not too thick.

How to Commence.

Let us suppose that we require a facsimile copy of a page from a book. First lay a piece of bromide paper—sensitive side downward—on to the page to be copied and hold it down with a fairly thick piece of glass. The glass may be weighted by standing a weight at each corner if necessary, so as to bring the bromide paper into close contact with the printed page. Arrange the whole lot under an electric lamp, as shown in the illustration; all this must, of course, be done in the dark room by red light only. Then make the exposure by switching on the electric lamp, thus exposing the bromide paper *through the back*. This, perhaps, sounds rather a silly thing to do, for obviously the bromide paper will be "fogged" all over; but never mind that, make a trial exposure, and when you get the exposure right you will find that although the paper is fogged, the part corresponding to the white background is much denser than the lettering, which will be easily visible by transmitted light.

The Time of Exposure.

This depends upon several conditions, such as nature of copy, speed of bromide paper, thickness of bromide paper, the type of lamp used and the distance of the lamp. As some sort of guide, the exposure should be about three seconds, using "Kodak Contrasty Nikko" bromide paper, on a good copy from a magazine printed on good white art paper, with a 40-watt lamp at a distance of 30in. from the book.



Details of the process.

After exposure the bromide paper should be developed up fully in the usual manner, and you will get a foggy-looking negative image. This paper negative is then fixed, washed and dried.

The next operation is to make a positive copy from the paper negative. This is done by placing another piece of the same bromide paper in contact with the negative—film to film—and exposing in an ordinary printing frame through the negative. In fact, you just make a bromide print in the ordinary way. The exposure this time will take a lot longer than before, owing to the heavy veil of fog on the negative, something between thirty seconds and one minute will probably be about right for a first trial.

The Best Results.

When this print has been properly exposed and developed in the ordinary way, a good clear copy of the original page should result. The best results are obtained from a good black image on smooth white paper; creamy-coloured rough paper will not be so satisfactory, but in such cases an improvement will be obtained if the first exposure is made through a slightly-tinted yellow glass screen, if such can be obtained, but the colour must not be very deep, or no results will be possible.

Although the writer has not actually tried it, probably a similar result to that obtained by using the screen could be achieved, by using an oil lamp for making the first exposure. This would necessitate considerable increase in exposure, but would probably give improved results.

Do not be discouraged if your first attempt is not satisfactory, and make several trial exposures on small pieces of paper only before risking a full size sheet, otherwise your failures may become rather expensive.

IN QUEST OF THE ELIXIR OF LIFE

By Raymond Ellis

The Magical Potion which would impart Perpetual Youth is still the Fantastic Dream it was in the Middle Ages, but Mankind's Span of Life is becoming Appreciably Longer from Generation to Generation.

THREE score years and ten! Such, we are told, is Man's allotted span of life, but from time immemorial he has striven with might and main to extend that lease, and even to attain immortal youth. Such legends and romances as "The Wandering Jew," "Dr. Faustus," and (of more recent vintage) "Valdar the Oft-born," have tended to warn us that perpetual youth may be a very mixed blessing indeed, yet, however much we may grumble at our earthly lot, there are few of us who would not quaff the mystic draught were it available!

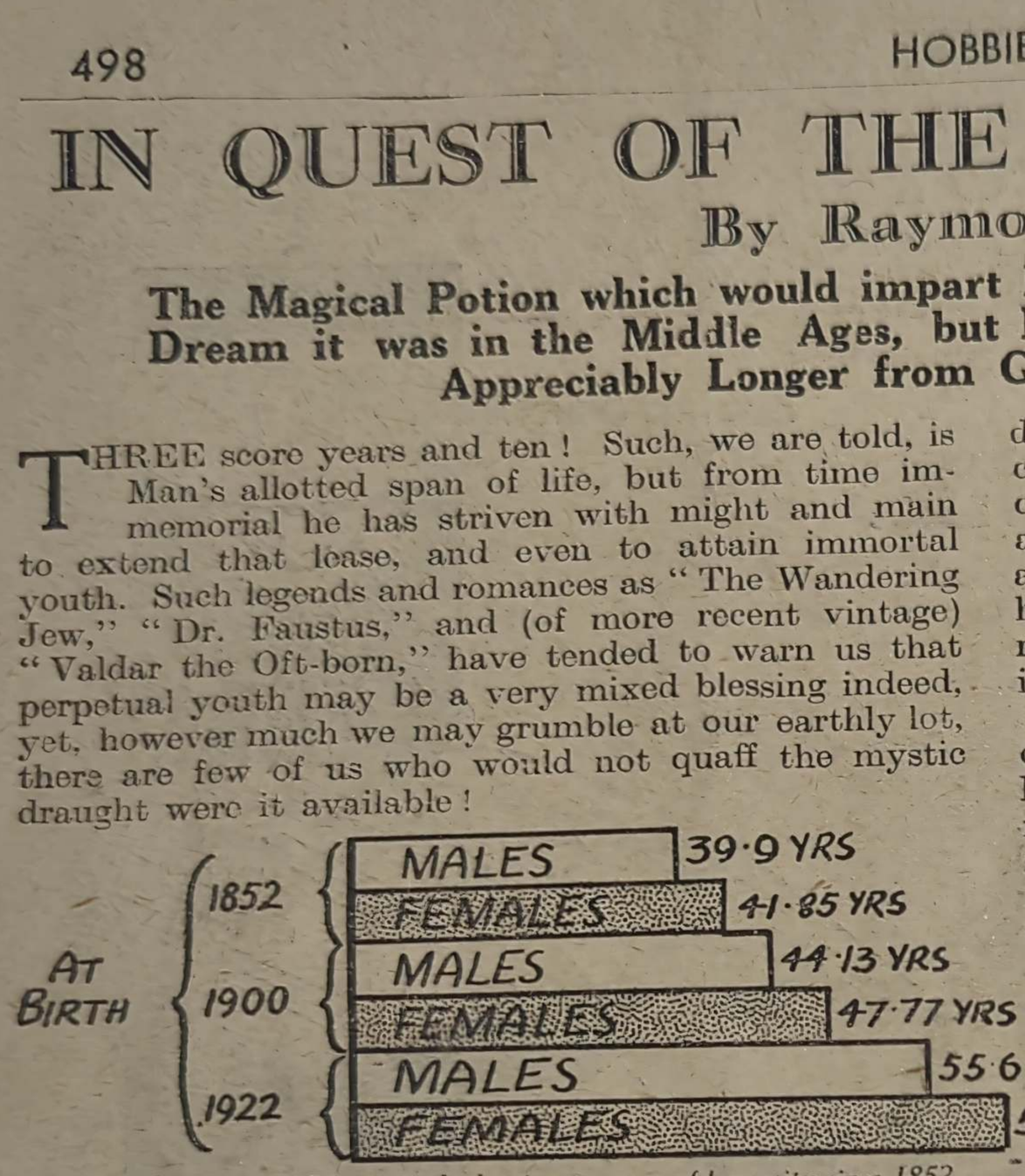


Fig. 1.—Expectation of life at birth showing increase of longevity since 1852.

Weird Concoctions.

The search, during ancient and mediæval times, for this mysterious Elixir Vitæ, was closely bound up with alchemy, witchcraft, magical ritual and rank superstition. The alchemists, searching for the Philosophers, Stone (which we discussed in our last article) were convinced that the mysterious "tincture," once found, would be efficacious in conferring on its lucky owner the necessary immortality to enjoy the immense wealth which, in its other function, the discovery would endow him with. There does not appear to have been any reasonable grounds for this belief, and it is to be feared that it was simply a case of the wish being father to the thought. On the other hand, many of the reputed witches and wise men of the period sought the elixir quite apart from any thought of metal transmutation, and, considering the pharmacopœia of the period, it is not to be wondered at when, in the musty old tomes of that time we find weird and wonderful concoctions which were stoically imbibed by the seekers of youth, but which, if suggested to-day, would horrify the least squeamish among us.

Heroic as these experiments were, they proved to be, alas! a snare and a delusion, for the bold drinkers found their nauseous cocktails quite useless as rejuvenators, though no doubt highly efficacious as emetics!

It is perhaps a sign of the times when we discover that the author of a quaint little book entitled "The Art of Prolonging Life by Food, Clothing, Peptic Precepts and Peristaltic Persuaders," which may be seen in the British Museum Library, has added, as a sort of an epilogue, a treatise on "*The Pleasures of Making a Will*"! Another investigator, one who evidently believed in making the best of things, came to the conclusion that, as he could not prolong his years he might cram many centuries of pleasure into them by finding a method of dreaming just the dreams he desired. In all seriousness he states that after much toil and travel he discovered an infallible method. First he gives a recipe "to fix the image of the desired dream," which is, to say the least, unusual.

"Take," says this sage, "the liver of a lamb one year old and cook it in three pints of eau-de-vie. Add a handful of juniper berries and boil till it is dry. Pound it all up in a mortar with 2ozs. of butter of antimony and 1oz. of powdered asphodels. Melt the fat of the lamb and, when boiling, add the preceding materials, cook for a quarter of an hour and let it cool."

An interesting unguent, but its mode of application is even more intriguing for "—to use this mixture, shave a tonsure on the top of your head, and put thereon a fly which has been smeared with the mixture. Be careful to take it off every morning and put on a fresh fly each night."

A Number of Recipes.

Having "fixed the image" our benefactor goes on to give a great number of recipes, some of them even more astounding than the above, by which he solemnly avers that any dream may be procured exactly to order,

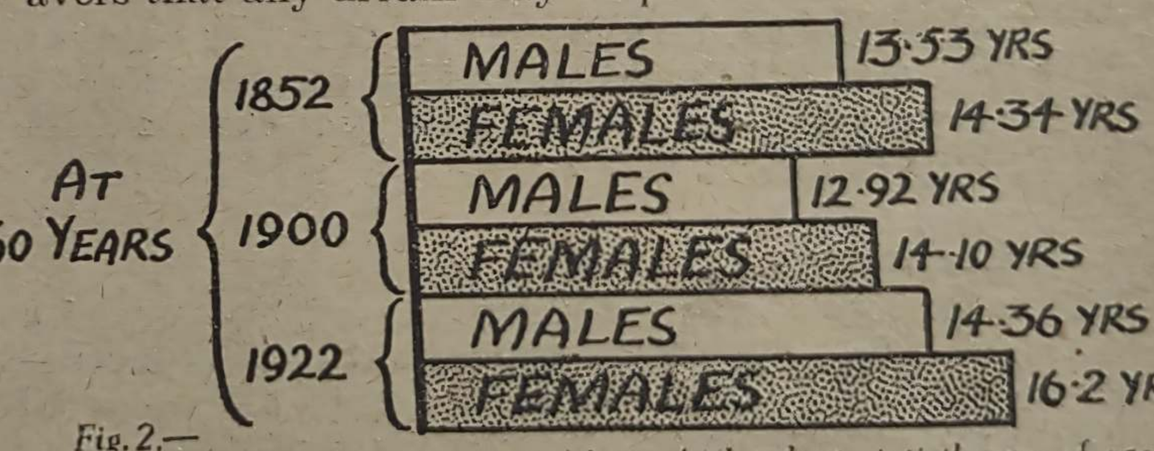


Fig. 2.—Life expectation over same period but calculated at sixtieth year of age.

and so man may live as long as he pleases and in any chosen condition *in dreamland*. Though the above sounds like Alice's friend the Mad Hatter, it was written and published in all seriousness, and the book is available like the one previously mentioned. The literature of the period is full of this kind of thing and well repays investigation. One gentleman, who wrote under the pseudonym of "Hermippus Redivivus," stated that

(*Continued on page* 500.)

Fig. 3.—Surprising proportion of female to male centenarians.

SIXTY EIGHT MALES OF ONE HUNDRED YEARS OF AGE OR OVER

TWO HUNDRED AND FORTY FEMALES

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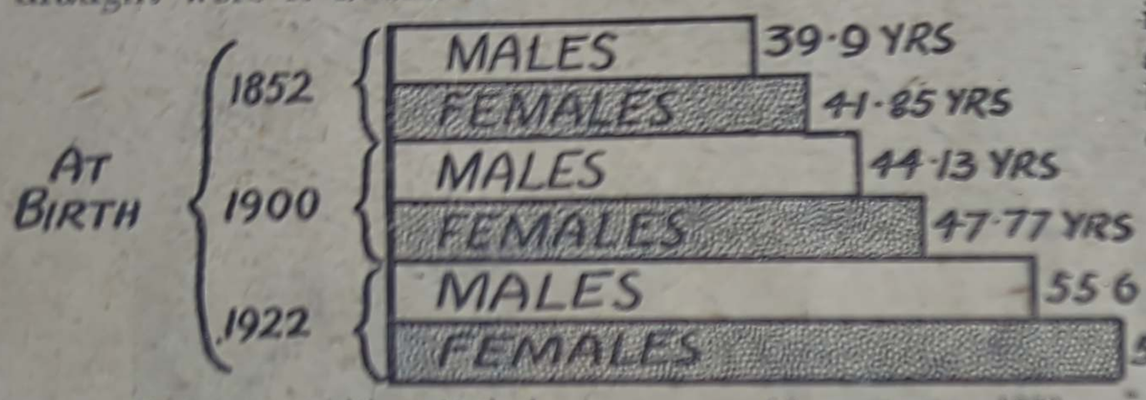

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Heroic as these experiments were, they proved to be, alas! a snare and a delusion, for the bold drinkers found their nauseous cocktails quite useless as rejuvenators, though no doubt highly efficacious as emetics!

It is perhaps a sign of the times when we discover that the author of a quaint little book entitled "The Art of Prolonging Life by Food, Clothing, Peptic Precepts and Peristaltic Persuaders," which may be seen in the British Museum Library, has added, as a sort of an epilogue, a treatise on "*The Pleasures of Making a Will*"! Another investigator, one who evidently believed in making the best of things, came to the conclusion that, as he could not prolong his years he might cram many centuries of pleasure into them by finding a method of dreaming just the dreams he desired. In all seriousness he states that after much toil and travel he discovered an infallible method. First he gives a recipe "to fix the image of the desired dream," which is, to say the least, unusual.

"Take," says this sage, "the liver of a lamb one year old and cook it in three pints of eau-de-vie. Add a handful of juniper berries and boil till it is dry. Pound it all up in a mortar with 2ozs. of butter of antimony and 1oz. of powdered asphodels. Melt the fat of the lamb and, when boiling, add the preceding materials, cook for a quarter of an hour and let it cool."

An interesting unguent, but its mode of application is even more intriguing for "—to use this mixture, shave a tonsure on the top of your head, and put thereon a fly which has been smeared with the mixture. Be careful to take it off every morning and put on a fresh fly each night."

A Number of Recipes.

Having "fixed the image" our benefactor goes on to give a great number of recipes, some of them even more astounding than the above, by which he solemnly avers that any dream may be procured exactly to order, and so man may live as long as he pleases and in any chosen condition *in dreamland*. Though the above sounds like Alice's friend the Mad Hatter, it was written and published in all seriousness, and the book is available like the one previously mentioned. The literature of the period is full of this kind of thing and well repays investigation. One gentleman, who wrote under the pseudonym of "Hermippus Redivivus," stated that

(*Continued on page 500.*)

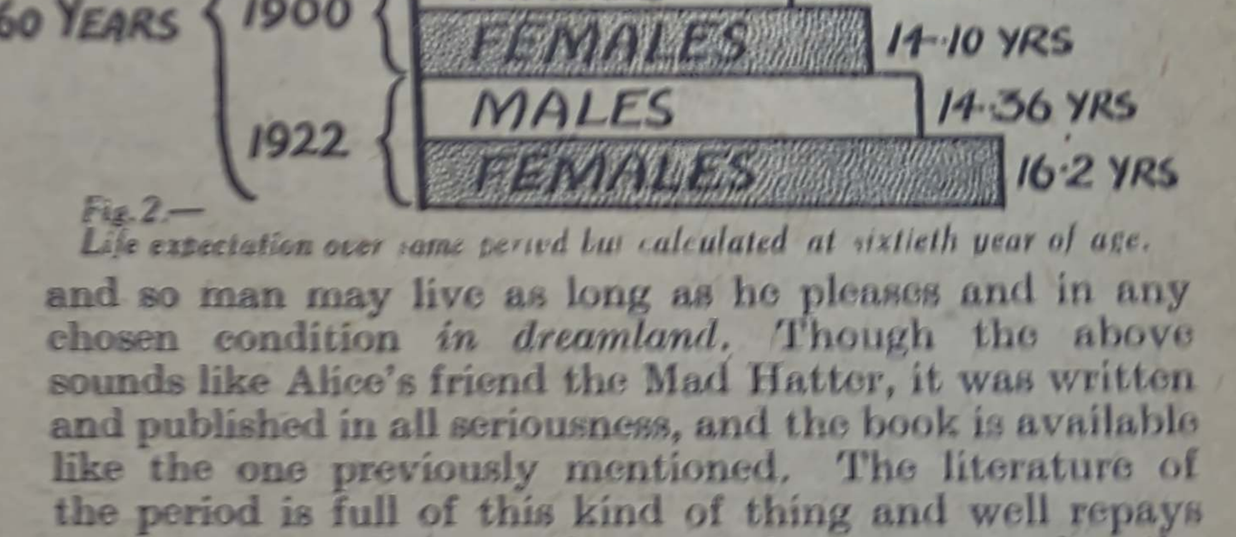


Fig. 2.—Life expectation over same period but calculated at sixtieth year of age.

Fig. 3.—Surprising proportion of female to male centenarians.

SIXTY EIGHT MALES OF ONE HUNDRED YEARS OF AGE OR OVER

TWO HUNDRED AND FORTY FEMALES

A COMPLETE GUIDE TO RADIOLYMPIA

THIS specially enlarged issue contains a complete guide to the Exhibits at Radiolympia. Also there are critical analyses of new receivers, new speakers, tuning coils, valves, etc., etc., and details for building three splendid receivers to suit all purposes and all pockets. The Superset will be the star set for 1934. The Auto-B Three is an entirely new three-valve receiver employing automatic bias and Class B amplification, and the All Wave Two is a specially cheap two-valver which covers all of the wave bands used for broadcasting from 14 metres upwards.

FULL DETAILS FOR BUILDING THE 1934 Superset

On sale at all Newsagents and Bookstalls, or by post 4½d. from George Newnes, Ltd., 8-11 Southampton St., Strand, London W.C.2

3D.

Practical Wireless

Geo. Newnes, Ltd.

THE ELIXIR OF LIFE (*continued from page* 498).

he extended his age well beyond the century mark "by surrounding himself with a galaxy of young and beauteous maidens who were always by his side that their fragrance and youthful vigour might be absorbed." He does not state what "Mrs. Hermippus" thought about it!

The Life Span Extending Without "Elixirs."

Numerous well authenticated cases of people who have lived as long as 120 years are recorded and, if official documents are to be relied upon, there died, in 1635, a man named Thomas Parr at the age of 153. These figures are, of course, dwarfed by records of age in creatures lower in the scale than mankind, for salmon, carp and pike are recorded at 100, 150, and 200 years old respectively, while the great age attained by elephants, whales, tortoises, etc., is almost proverbial. In the vegetable kingdom ages are even more surprising, and there is, in the Natural History Museum, South Kensington, a section from a sequoia tree which indicated an age of 1,335 years.

Of late years, however, man himself is beginning to show distinct proof that his life span is becoming longer than in the past, and a comparison of the statistics for the past century is very interesting.

Accurate compilations of the great insurance companies, who in their own interest keep accurate track of these figures, show that, in 1922, the average male expectation of life in a newly born child was 55.6 years as compared with only 39.9 years in 1852—an increase of over fifteen and a half years. In the corresponding period the female life expectation increased from 41.85 years to 59.58—a difference of almost eighteen years. It is curious to note that, right through the records, women outlive men by a very considerable margin. It will be very interesting to note the figures available in, say, 1940, especially in view of the fact that women have, during the past decade, absorbed more and more the habits, occupations, privileges, and—shall we say?—vices of what used to be regarded as the sterner sex.

A glance at Figures 1 and 2 will show clearly the ascendency of woman over man in the search for longevity, but, at the same time, it will be noted that there is a steady increase in the life span of both sexes, and there is no reason to believe but that this progress will be kept up. Undoubtedly the advances of medical science and hygiene are contributing causes, while modern housing conditions, clean towns and the dissemination of knowledge each play their part in making the human being more careful of his physical well-being, and so enabling the system to resist disease and the advance of senility.

As to whether Science will ever be able to produce an "elixir" which will enable the endocrine glands to continue producing the hormones necessary to counteract ageing of the tissues and cellular degeneration is a moot point, and one on which few people would care to prophesy, but that mankind in the future may look for a very much extended span of life is almost certain. The recent work of investigators has shown that the most wonderful mechanism in the world—the human body—may be, and actually has been, made to function again after it has to all intents and purposes ceased work. Operations and resuscitations are taking place almost daily which, a few years back, would have been regarded as utterly impossible of accomplishment.

"Monkey Glands."

Much has appeared in the daily Press of late regarding the rejuvenation of the aged by the grafting of endocrine glands into the human body. The idea, by its very novelty caught the public fancy, and while a great deal of knowledge has been obtained by these experiments—especially the work of Dr. Voronoff—a great deal of nonsense has also been written.

Experiments in gland grafting have been going on for a long time, and it is largely to such work that the modern knowledge of the purpose and functioning of the endocrines and their secreted hormones is due, but the popular idea that any septuagenarian, who can afford to pay for having a "monkey gland" grafted will immediately become endowed with second youth is an utter fallacy. The glands so grafted do, for a time, supply a needed amount of the necessary hormones, but become exhausted and, not only does senility reappear, but when it does is often much more advanced than it was before, owing to the terrific drain on the physique of the subject during the period of false rejuvenescence.

Sound health, clean living and contentment with one's lot constitute what is probably the best prescription for an Elixir Vitæ, while "*mens sana in corpore sano*" should be the slogan of all who wish to tread the path of perennial youth.

Practical Letters FROM OUR READERS

Weekly Articles on Model Aeroplanes.

SIR,—With reference to the paragraph in your Editorial columns about "Model Aeroplane Topics," I am sure that it would prove an astounding success if it were made into a weekly article. In it you could introduce all the latest models and competition results of the S.M.A.E. and T.M.A.C. and R.O.G. flights.

Why not give it more space? after all, it is the coming thing, and describe and give illustrations for making flying scale model aeroplanes, few of which can be seen. A boy, or man as far as that goes finds more pleasure in flying a model which exactly resembles its prototype.

I hope that this intimation of mine will push forward Model Aeronautics another step in your weekly wonder-paper. I may say that three of my pals who take it HOBBIES are also in favour of it.

ARTHUR J. RUMSEY (Burton-on-Trent).

Another Model Aeroplane Enthusiast.

SIR,—Re your note in a recent copy of HOBBIES. I for one hope that you will continue your aero articles and expand them if possible. Yours is the only weekly mag. to have aero constructional and other interesting articles. Being interested in scale-flying models, I am also a reader of that excellent American bi-monthly magazine, the *Cleveland Modelmaking and Aero News* which I can well recommend to any other interested HOBBIES readers. Your photos and notes on the American models have been appreciated. I would like to congratulate you heartily on the full-size glider series, as I guess many other readers have been looking forward to a good article of this sort, for a time. The model aero engine has been interesting, as well as your model railway series. Other articles are still up to standard. Thanking you.

C. J. HARDING (Newcastle-on-Tyne).

NOTES & NEWS

Friends Everywhere.

LEAGUE members all over the world are taking advantage of the opportunity of making friends with people of other nations, and I am constantly giving addresses of correspondents. Other lists appear from time to time in these pages, too, and I want every member to take an interest in this side of the activities of the League. Many fellows are finding it useful in helping them in languages. Others are making use of the Correspondence Club to find up lost friends and relations in other countries, whilst others are learning a whole lot about other places through their letters with various Members. There is no doubt that this making of friends in other parts helps to give one a wider outlook. You gradually get to know about how they live, say, in India, or in South America, and realize how different in some respects their lives are from ours.

A Knowledge of English.

I MUST say that I have been surprised, too, at the excellent English which many of the overseas Members use, although not British themselves. Because, after all, it must be remembered, that many of these members have not had the advantage of the fine schools and elaborate education we have here in Britain. Very often they have to study the language for themselves, and learn it properly. And you who are now swotting the peculiarities of any other language, know what that means!

Not All British.

A LETTER came, for instance, recently from Malacca, where an enthusiastic member is acting as leader to a class of fellows he is training in fretwork and woodwork. The boys, he says, do not speak English—does this prevent them joining the League? Why, of course, I wrote him that everyone was welcome, whether they speak English or not. The world is made up of millions of people, and it will be better for all of them if it is possible to get to know each other better. If you get a letter from abroad then, where the grammar is bad, and the spelling is not so good as it might be, remember that that fellow is just as keen a League member as you are, and probably just as good a fellow, too. The fact that he talks a different language and lives in a different country makes it all the more interesting for both of you, doesn't it?

A Transvaal Club.

MEMBERS living in the Transvaal will be glad to hear that Noel D. McLean, of Germiston, is anxious to form a club in that district. Readers and Members in Germiston or Jo'burg or that area should write to Mr. McLean, c/o P.O. Box 6, Germiston, and he will, no doubt, let them know all about the proposed club.

The League Transfers.

I HOPE members who make the oak frame for their Certificate will remember that there is a special diamond transfer which they can use to put at the top in the place provided. These transfers have been specially printed in the League colours and are just the right size. They measure 3½in. by 1¾in. and are supplied, ready to fix, for only 2d. post free. Of course, there is no reason why they should not be added to all the woodwork articles any Member makes. It will then be a sort of trade mark for you, by which your customers will know what good work can be undertaken by League Members.

Particulars of the League

IF you know of any reader or worker who has not yet had particulars of the League, please tell him to write for the interesting free booklet. It contains full details of joining as well as the test panel for cutting which he has to send along when he joins up. That is the only expense concerned because the League is not like so many societies, where an annual sum has to be forwarded. Write to me at the headquarters of the Hobbies League, Dereham, Norfolk.

Send Me News!

WILL the secretaries of the different Clubs let me know fairly regularly how they get along? I want to keep in touch with them as much as possible and can often suggest various items of interest to tell them of Exhibitions coming along. Usually they just say the Club is getting along nicely and leave it at that. They should be able to get in some excellent out-of-door work now—and include rambles, or photographic hikes, or outdoor sports, etc. Will you, please, secretaries, let me have fuller reports of your doings, so they may be published in these pages for the benefit of others? And photographs, too, remember!

A Home-made Fretmachine.

I HAD an interesting picture (unfortunately not good enough to reproduce here) of an ingenious fretmachine which a member had made out of a cycle. It appeared to be something like one of the ancient English cross-bows wound up with a large cycle wheel, a portion of the frame and the pedal, a few pieces of Meccano, and some wood. The whole thing was certainly novel, but the contraption looks rather dubious to work and would seem a little apt to fall to pieces almost at any moment. F. W. Burkitt, of Dunstable, who made it, must have used considerable skill and brains, however, to work the machine out and we hope he is able to get along with it. Personally, I should prefer the much more simple and comfortable Gem machine which is so popular.

The Registrar

A LIGHT BOOK TROUGH

A Job for the Home Carpenter.

WE are constantly being asked for designs for bookstands and book troughs, to be made up in oak or mahogany. This week, we give another simple suggestion for a trough that would look well made in either of the woods mentioned. Books about standard size, viz., 7½in. by 5in., are easily accommodated, although smaller ones, such as pocket editions or text-books, would suit the size of stand better.

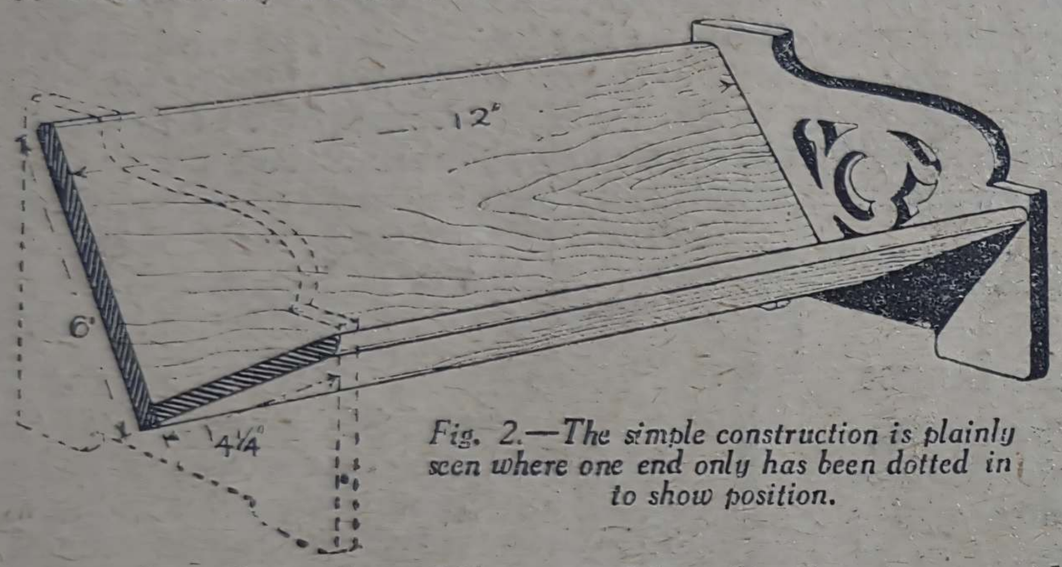


Fig. 2.—The simple construction is plainly seen where one end only has been dotted in to show position.

Any length up to 12in. would suit the type and thickness of ends given here, but it is not recommended to exceed this length on account of the undue strain that would come upon the ends when loaded with books, and the rather squat appearance that would result.

The Wood Obtainable.

Wood ⅜in. thick is used throughout for this article, and a parcel of beautifully planed stuff all ready for receiving the pencilling in of the design, if this method be used, and the cutting, is supplied by Hobbies for 2/3 in either wood (No.197). The great advantage of using these parcels for making things is that practically no cleaning up is necessary when the work of cutting out has been done, and the surface, too, is ideal for polishing or varnishing.

A Suitable Finish.

If, however, the worker should desire to stain the wood before polishing, then a light sandpapering should be given after the staining, to take away any roughness, for it is well known that almost any stain will raise the grain of the wood slightly and cause a roughness.

Work should be begun on the two ends, and it will be best to make paper patterns for these from the squared diagram (Fig. 1). On thin paper draw an oblong 7in. by 6½in., taking care to get the angles perfect right angles, and then divide this into half inches each way and run the lines across to form a series of squares. Draw in the outline and the simple scroll inside, with also the positions of the sloping back and shelf, shown by dotted lines on the diagram by following each square carefully.

The worker will find by practice that enlarging by this method is both interesting and simple, and having carried out one or two exercises of a similar nature he will become quite an adept. Having drawn in the design the actual outline and scrollwork should be lined up with a heavy line, and a second copy then produced by carbon paper placed between this copy and a clear sheet of thin paper.

Two Jobs at Once.

It will not be necessary on the second copy to put in the dotted lines of the back and shelf, nor the screw-hole positions, as these latter will be made later on by laying the two pieces of wood together and clamping them, and then boring the holes through both pieces from the positions given on the first pencilled pattern.

Stick the two patterns to the wood and leave to dry thoroughly before commencing the cutting with a fret-saw. It is necessary in cutting thick wood like this to keep a perfectly perpendicular cut. The cutting finished, the paper pattern is cleaned off by means of sandpaper.

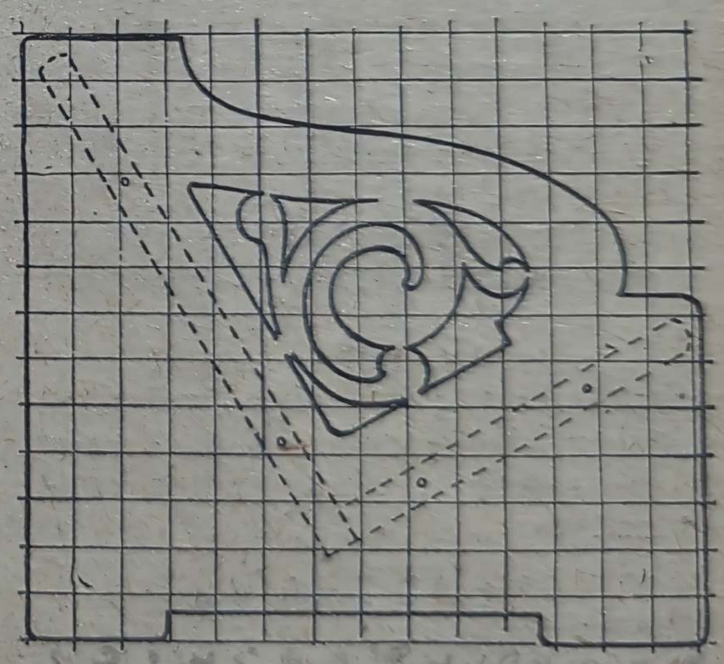
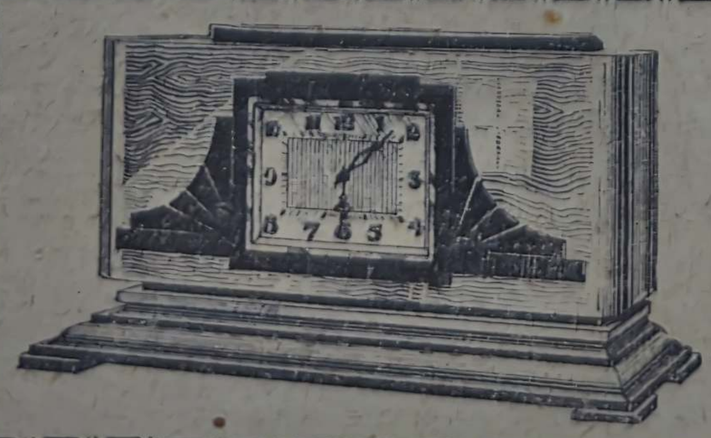


Fig. 1.—Mark out these ½in. squares and line in the design of the ends before cutting in wood.

The back and the floor are plain pieces, the former measuring 12in. by 6in. and the latter 12in. by 4¼in. Mark these off on the wood, keeping the corners square and at 90 degrees. Round off one edge of each piece with coarse and fine sandpaper, the other edges being planed square and glued up, as in the diagram, Fig. 2, which shows these parts in relation to the ends.

The positions of the screw-holes in the ends of the back and shelf should be lightly pricked in by holding them against the ends in the positions they are to ultimately take. By doing this, the assembling of the stand is simple when the

(*Contd. on page* 504.)



How to Make This Clock

This modern clock case is made quite easily from full-size patterns to be given next week. Be sure you have your copy on Wednesday.

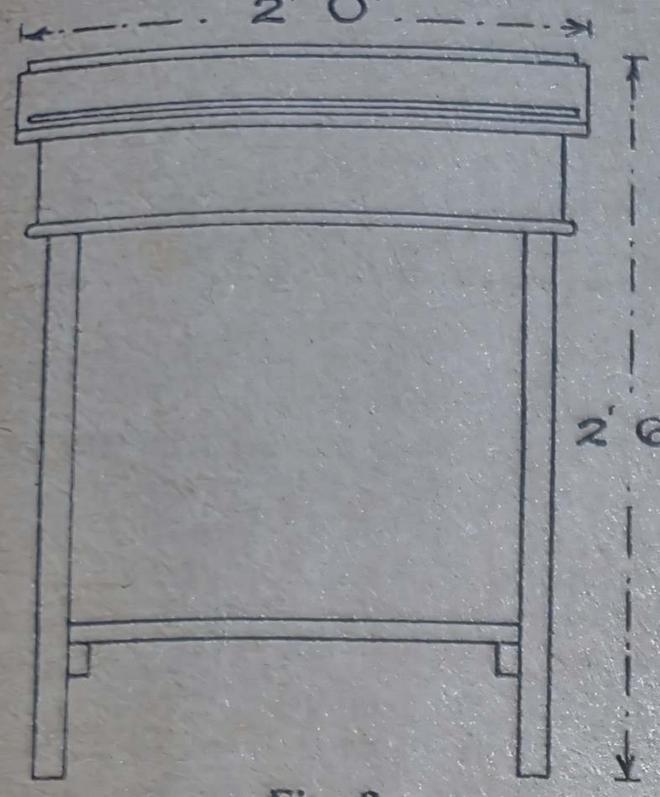
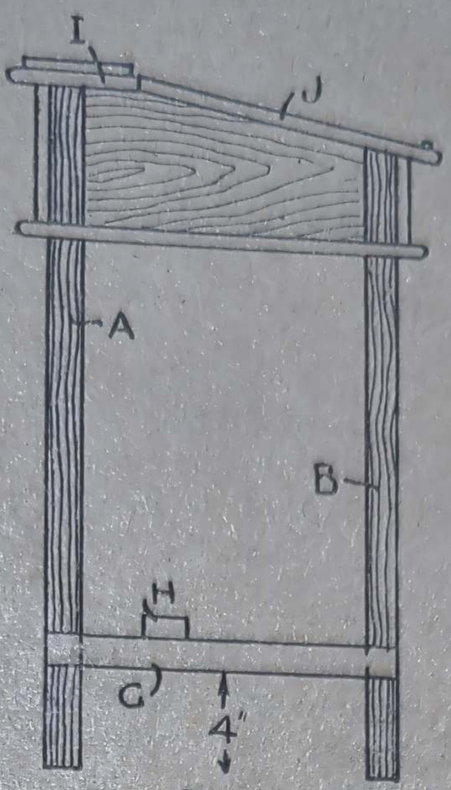


Fig. 2.



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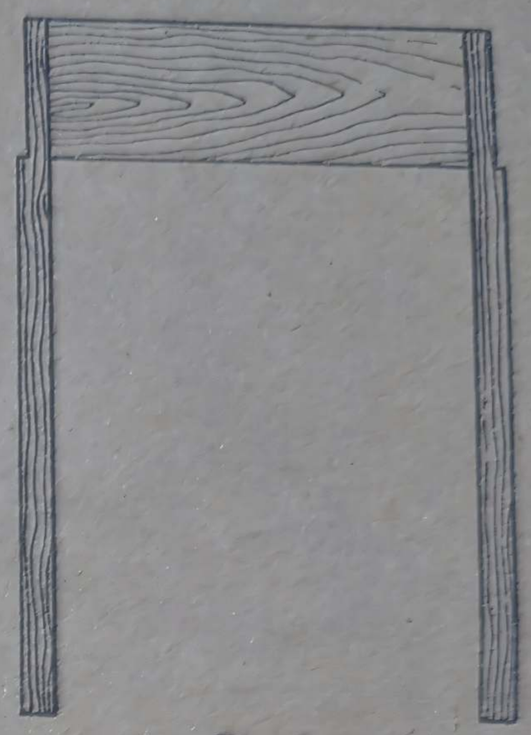
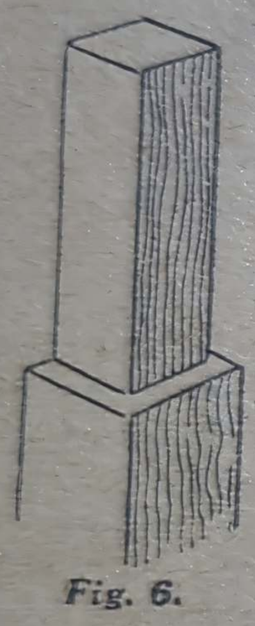


Fig. 5.



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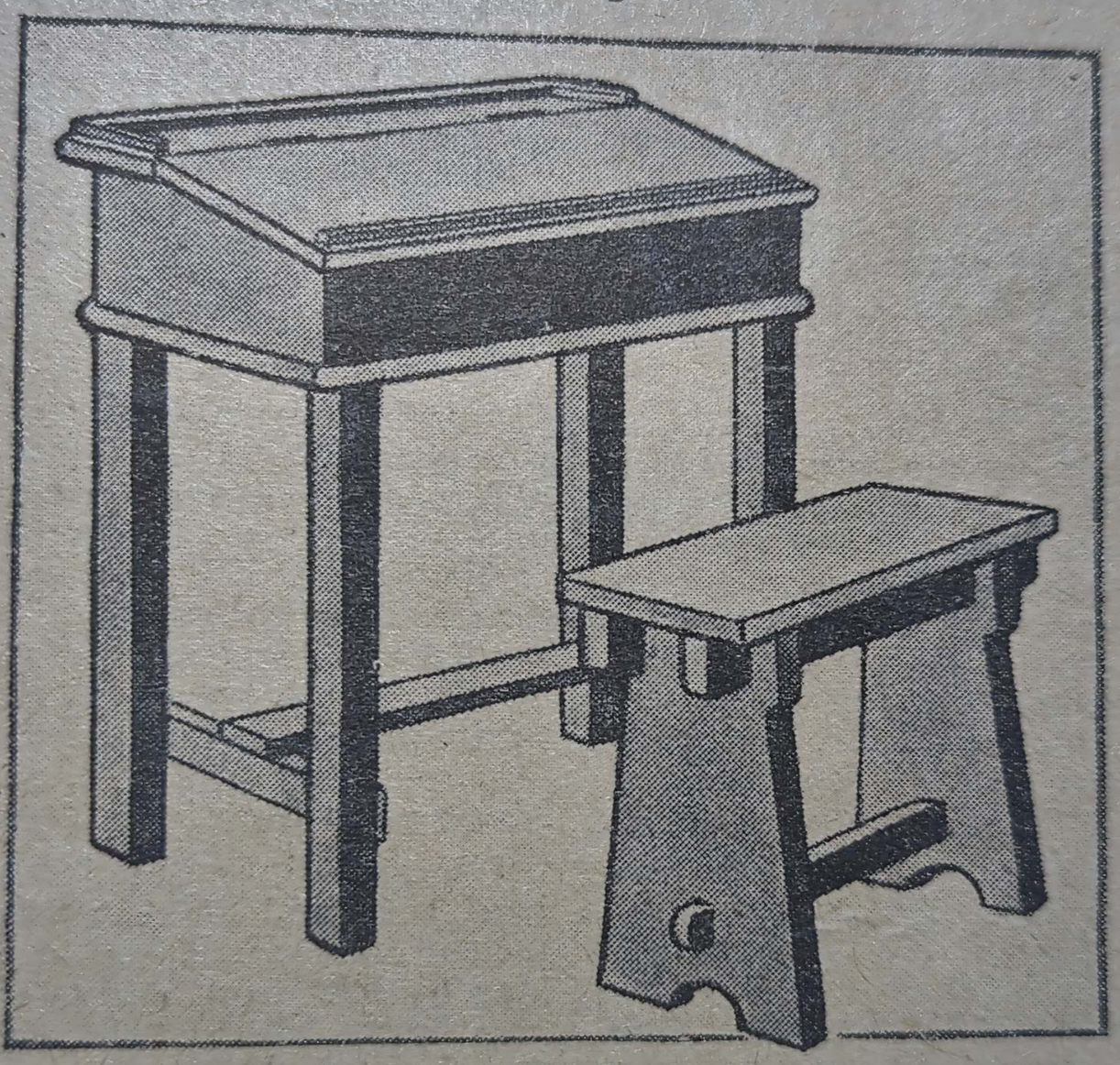

Fig. 1.

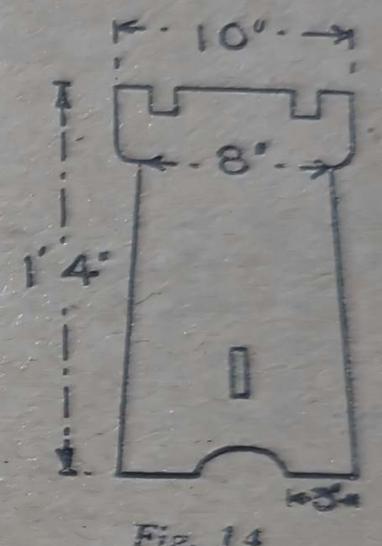

Fig. 14

Fig 15.

Fig. 16.

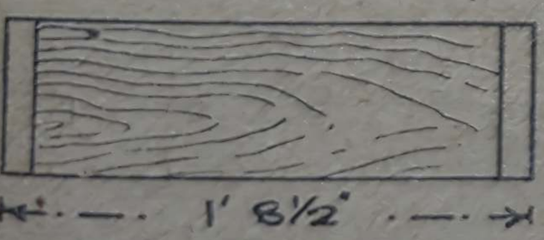

Fig. 7.

Fig. 9

Fig. 8.

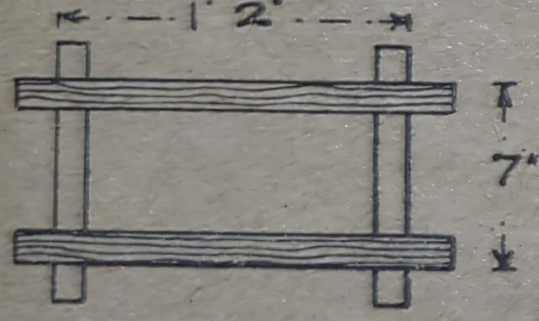

Fig. 13.

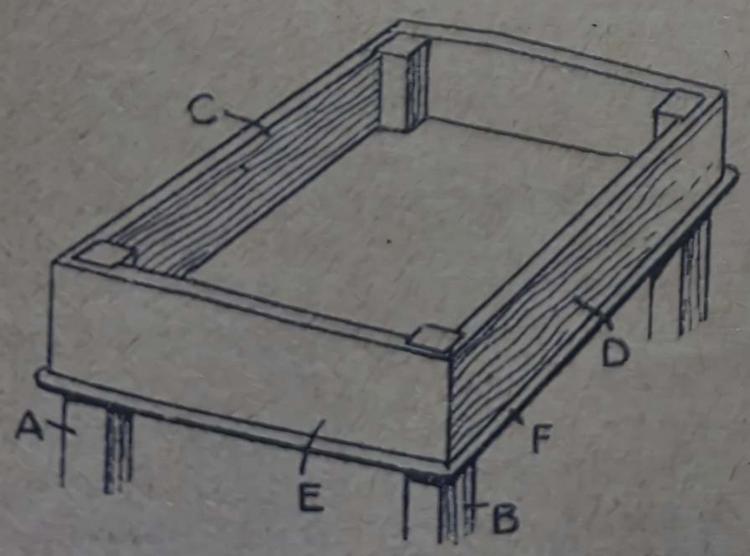

Fig. 4.

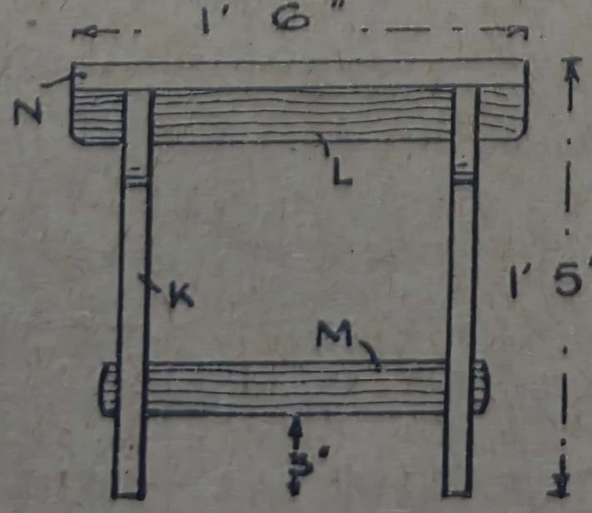

Fig. 11.

Fig. 12.

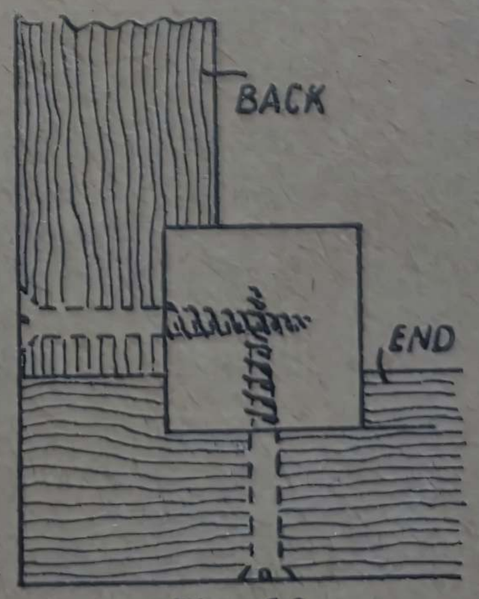

Fig. 10.

How to Make a BOY'S DESK and STOOL

Just the thing any amateur carpenter can make for his young son or nephew. If you are a boy ask the dad to make one for you.

THE desk and stool shown at Fig. 1 will be coveted by all our boy readers, but need not be coveted in vain, as it may be made by any enterprising boy skilled in the use of a few tools. Everyone knows how useful a desk of this kind would be, providing a private place where work or reading could be done without interference, and as the flap is hinged to open, the space under will hold quite a number of books or papers.

The Parts Required.

The work has been kept on simple lines, and the construction is, perhaps rather out of the ordinary, to enable it to be done with as few tools as possible. Almost any kind of wood is suitable; the legs should be strong, and not of less substance than the sizes quoted, but it should be possible to cut the other parts from packing case wood, such being quite suitable.

The back legs A are 2ft. 5in. long, and the front legs B, 2ft. 3in. long by 1¼in. square. The back of the desk C (Fig. 4) is shown at Fig. 7, the front, D, at Fig. 8, and one end, E, at Fig. 9, all being cut from 1in. wood.

Method of Construction.

To enable the parts to be strongly fitted together, the legs, back, front, and ends have shoulders ¼in. deep cut on them. The legs are treated on two sides, as shown at Fig. 6, the shoulders on the back legs being 6in. long, and on the front 4in. long. The shoulders on the back and front are 1in. long, and those on the ends are 1½in. long.

In fixing the parts together take the back pair of legs and screw the back to them, as shown at Fig. 5. Next screw the front to the front pair of legs in a similar way, and then screw the ends to the front and back legs. The screws are driven through the front, back, and ends, into the legs, and a glance at Fig. 10 will make the fixing quite clear. The screws should be carefully driven to prevent splitting, and the joints should be glued.

The bottom of the desk, F, need not be more than ½in. thick, fitted over the legs. The edges should overhang slightly and be rounded, while nails are used for fixing. It will be noticed that the rounded edges will cease at the points where the bottom is fitted over the legs; and small pieces of wood should be fitted from these points to the corners to form an unbroken edge.

The bottom rails, G, are 1½in. deep by 1in. thick, screwed in position, and the foot rail, H, which is 2in. wide is fixed above.

The Top of the Desk.

The top of the desk, I, is 2ft. long, by 5in. wide, the back and end edges are rounded, and it is fixed with screws or nails. The flap, J, is also 2ft. long, and is wide enough to overhang about 1in. at the front. It may be necessary to strengthen the flap with cross-battens, and it is hinged to the top with a pair of 1½in. hinges. Small slips about ½in. square are fitted around the back and end edges of the top, and across the front of the flap, as shown at Figs. 1, 2, and 3, to prevent things placed on the desk from slipping off.

Making the Stool.

If a stool is required one similar to that shown at Figs. 1, 11 and 12, may be easily made. The ends, K, are cut as shown at Fig. 14, the top rails, L, are 1ft. 6in. long by 2in. deep, and the bottom rail, M, is 1ft. 3in. long by 2in. deep. The top rails are notched into the ends, notches being cut as shown at Figs. 14 and 15 to enable the rails and ends to be fitted together as shown at Fig. 13. The bottom rail is tenoned into the ends, as shown at Fig. 16. These parts should be fixed together with glue, and the top, N, which is 1ft. 6in. by 10in. is simply nailed in place.

The desk and stool, on completion, could be stained and varnished or painted.

A BOOK TROUGH (*continued from page* 502).

polishing or varnishing has been completed. Screws 1in. long and with flat heads should be used for the fixing, the holes being countersunk so that a filling can be made afterwards of plastic wood. This material can be sandpapered down perfectly flat and stained and polished over to look like the surrounding wood.

If the stand is made of oak it may be stained lightly, or a dark stain used, and french polished. No better finish could be imagined than Hobbies Lightning Polish, put upon a nicely stained surface, and bottles of this polish can be bought for 1s., containing sufficient for covering several articles such as this stand.

If mahogany is used it will be necessary to strengthen the joints between the back and floor and the ends with small square angle fillets cut from the waste wood of the ends, and glued in the angles at the back and underneath the floor.

The fillets will not be conspicuous when polished and stained over nicely. Dark mahogany stain would look well for the stand if it is made of the mahogany, and a finish given of Lightning Polish.

PRINTED BY NEWNES & PEARSON PRINTING CO., LTD., Exmoor Street, Ladbroke Grove, W.10, and published by GEORGE NEWNES, LTD., 8-11, Southampton Street, Strand, W.C.2. Sole Agents for Australia and New Zealand: GORDON & GOTCH, LTD. South Africa: Central News Agency, Ltd.

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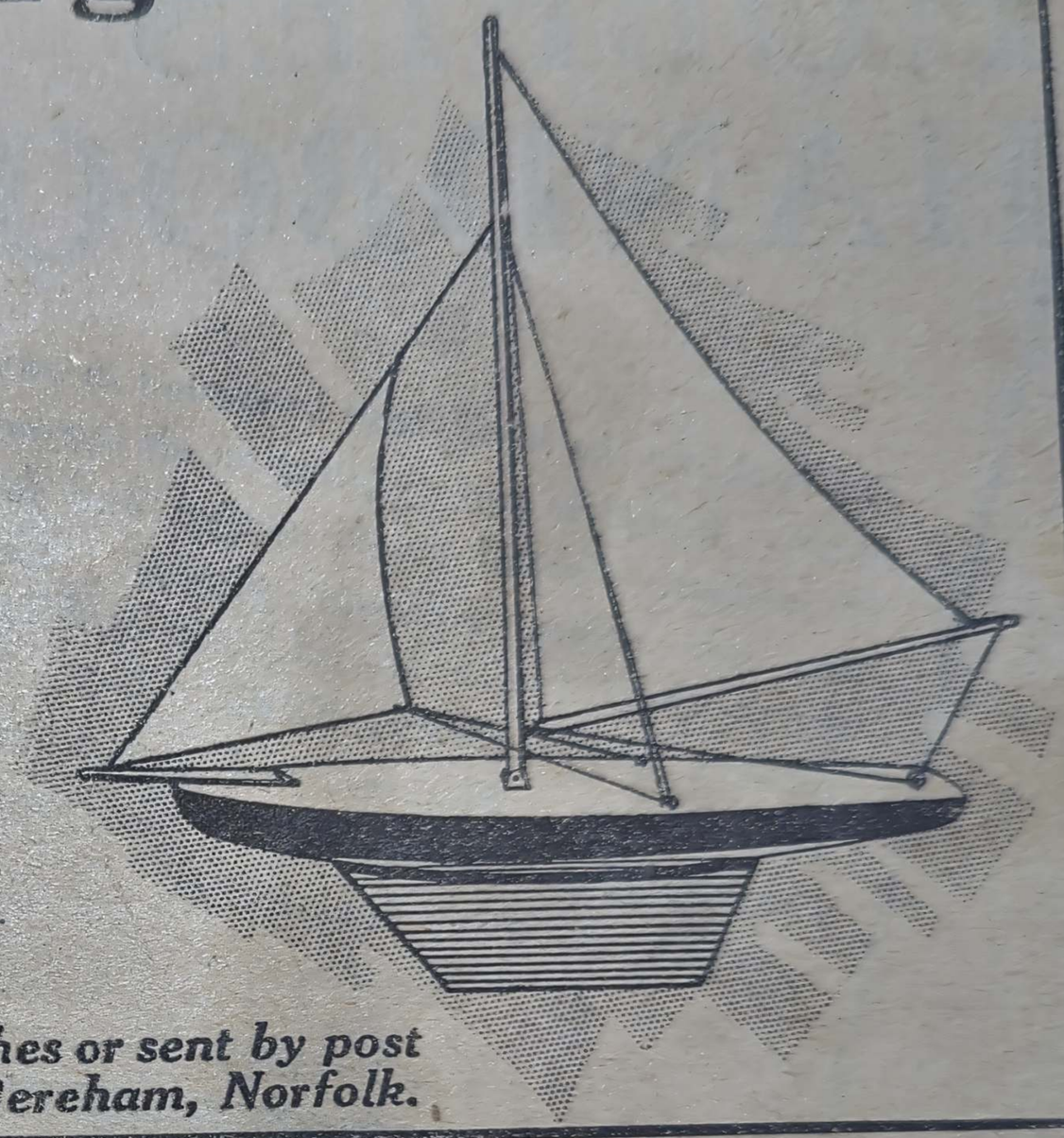

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